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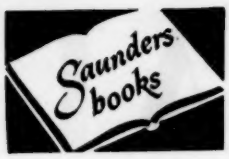

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MANAGEMENT OF DIABETES MELLITUS IN PATIENTS UNDERGOING SURGERY

Charles R. Shuman, M.D., Philadelphia

Diabetes mellitus has ceased to be a contraindication for any type of operation. The number of diabetics who receive surgical treatment has steadily increased during the past three decades since the discovery of insulin and will continue to increase in future years. Among the factors responsible for this rise are longer survival, bringing diabetics into the age groups most prone to diseases that require operation; increasing incidence of diabetes in the general population, predisposing to gangrene and infections that require surgical intervention; and development of safe techniques for elective operative procedures formerly eschewed in treating the diabetic. Skillful treatment with insulin and diet and modern advances in operative techniques, anesthesia, fluid and electrolyte balance, and antibiotic therapy have virtually eliminated the former conditions of starvation, acidosis, and infection that led to a high operative mortality among diabetics. Thus, surgery has become as safe for the diabetic as for the nondiabetic.[1] From 1950 to 1953, I attended 340 patients who underwent 373 operations while under the supervision of the diabetic service of the Temple University Hospital. The records of these cases have been analyzed from the standpoint of surgical diagnosis and procedure, type of anesthetic, presence of preoperative complications, preoperative diabetic status, and postoperative course; in addition, the details of diabetic management before, during, and after operation have been evaluated, to outline the recommended treatment for the control of such patients and the complications that may be encountered.

COMPLICATIONS

When surgery is indicated for a diabetic, the presence of complicating diseases requires careful appraisal. In the evaluation of this group of diabetic patients for surgery, the principal vascular complications encountered were 104 cases of arteriosclerosis, including arteriosclerotic heart disease or peripheral arteriosclerosis, or both, and 73 cases of hypertensive cardiovascular disease. In addition, there were 3 patients with mitral stenosis due to rheumatic heart disease, one with pericarditis, and 12 with systolic murmurs, 7 of which were diagnosed as aortic stenosis. Four of the hypertensive patients were regarded as having intercapillary glomerulosclerosis; 18 of the patients with heart disease were treated for cardiac decompensation during the operative period. Diabetic retinitis was found in 42% of this group. Although the duration of diabetes is of some importance in the occurrence of these vascular complications, 12 patients were found to have characteristic retinopathy with previously undiagnosed diabetes. In six patients, diabetic gangrene or infection was the first indication of this disorder.

Other complications encountered preoperatively in these patients included diabetic neuropathy in 62 instances, significant proteinuria in 51, and urinary tract infections in 10. Nutritional evaluation disclosed obesity in 52% of the group and undernutrition in 8%, with 40% in optimum nutritional status as defined by the standard weight tables. Serum cholesterol, albumin, and globulin levels and hemoglobin values revealed significant alterations in many patients. Of the 212 cholesterol determinations reported, 76 exceeded the accepted upper normal limits of 250 mg. per 100 cc. Levels of plasma albumin below 3.8 gm. per 100 cc. and of hemoglobin below 12 gm. per 100 cc. (alkali hematin determination read photoelectrically) were observed in 36% and 30%, respectively, of the patients on whom these tests were performed. The high incidence of complications of diabetes may be related to the age of the patients involved in this study, the majority of whom were over 45 years of age. In 54 patients, diabetes was first diagnosed on admission to the hospital. The average duration of the disease prior to operation for the entire group was 8 years; the longest known duration was 30 years.

MORTALITY AND MORBIDITY

There were no deaths directly resulting from diabetes mellitus or its treatment. Nine patients died in the postoperative period, an incidence of 2.5%. The high incidence of arteriosclerosis and hypertensive disease is reflected by the occurrence of three deaths due to cerebrovascular accidents. Two of these patients had had amputations for diabetic gangrene; in the third patient, marked hypotension developed postoperatively, and

Associate in Medicine, Temple University Hospital and School of Medicine.
1. Pratt, T. C.: The Diabetic as a Surgical Risk, Bull. New York Acad. Med. 26: 786, 1950.

death followed cerebral artery thrombosis. Two patients who had had leg amputations for diabetic gangrene died of uremia resulting from Kimmelsteil-Wilson syndrome with renal failure; four other patients with this serious and often fatal complication of diabetes made successful postoperative recoveries. Two patients died of pulmonary embolus; one of these had advanced generalized arteriosclerosis, and the other, carcinoma of the pancreas. Two deaths were attributed to obstruction of the small intestine with metastatic carcinoma. Other deaths resulting from the diseases that necessitated operation have not been included here because postoperative convalescence was completed. These diseases were carcinoma of the colon, pancreas, and liver, and one subphrenic abscess that occurred several weeks after a cholecystectomy.

Despite the fact that more than a third of these patients were known to have cardiovascular disturbances attributable to arteriosclerosis, hypertension, or rheumatic heart disease with mitral stenosis, there were no deaths due to congestive failure or myocardial infarction. The last condition developed in two patients postoperatively and had been present in four others preoperatively. On appearance of signs of fluid retention, patients with heart disease without previous therapy were treated with intramuscular injections of digitoxin (Digitaline Nativelle), 1.2 mg. in divided or single doses, sodium chloride restriction, and diuretics. When parenteral feedings were required concentrated solutions of dextrose or fructose were administered at a slow rate. It has been my policy to permit slight hyperglycemia in patients with known heart disease and to avoid the vigorous treatment of marked hyperglycemia unless ketosis threatens. A fasting blood sugar level between 150 and 180 mg. per 100 cc. may be desirable before and after operation, and higher levels should be only gradually reduced in cardiac patients with diabetes. However, sustained hyperglycemia with a blood glucose level above 200 mg. per 100 cc. should not be permitted because of the predisposition to infection, poor wound healing, body protein loss, and ketosis. With careful regulation, a slight hyperglycemia gives a margin of safety against hypoglycemia. Genitourinary tract infection is an important cause of postoperative morbidity, especially in patients who undergo pelvic and prostatic surgery or who require catheterization. In 23 instances this condition delayed postoperative convalescence, and, except for inflammatory processes such as carbuncles, directly attributable to diabetes, it was the most commonly encountered type of infection. As routine examinations for such infection were not performed, the incidence may have been higher than is stated. Of the patients examined, 16 were predominantly infected with Escherichia coli, five with Pseudomonas, and the others with Staphylococcus albus and anhemolytic streptococci. The penicillin that was routinely given to most surgical patients postoperatively afforded no protection against these organisms. Sulfisoxazole (Gantrisin), streptomycin, and oxytetracycline (Terramycin), singly or in combination, were used to treat these infections. The mortality and morbidity aspects of surgery in diabetics are more closely related to the disease necessitating surgery, the vascular complications of diabetes, and infections than to the diabetes itself, when the patient is under careful metabolic supervision. The proper management of infection with antibiotics and of cardiovascular complications with quinidine sulfate, digitalis, and sodium chloride restriction has somewhat reduced the importance of these factors.

DIAGNOSES AND OPERATIVE PROCEDURES

A total of 78 different types of operations made up the group of 373 surgical procedures, 150 of which were considered major operations. The most frequent condition necessitating surgery was diabetic gangrene with or without infection and osteomyelitis, for which 58 amputations were performed: 27 major amputations and 31 minor, including 4 transmetatarsal resections. Operations requiring anesthesia were performed on 20 patients with extensive abscesses, carbuncles, and other infections. Operative procedures were used to treat carcinoma in 49 patients. Usually the tumor was removed by the appropriate surgical methods; palliative procedures were used for such diseases as pancreatic and esophageal carcinoma. Among the other major surgical interventions in this group were cholecystectomy for cholecystitis and cholelithiasis, 15; panhysterectomy and bilateral salpingo-oophorectomy, 17; thyroidectomy, 6; cesarean section, 3; and laparotomy, 8. The average duration of operation was about two and a half hours. The longest procedure lasted eight hours.

The diagnosis of intra-abdominal surgical emergencies in the diabetic may be difficult because acidosis occurring in diabetes is occasionally characterized by abdominal pain, localized or diffuse, with nausea, vomiting, constipation, leukocytosis, and tachycardia. It has been suggested that pain arises from loss of sodium chloride through the diuresis seen in uncontrolled diabetes. However, a complicating disease may produce a similar clinical picture with acetonuria in the diabetic. If symptoms of polyuria and polydipsia precede the onset of abdominal symptoms, the diagnosis of acidosis is favored. Persistence of pain after corrective treatment of diabetic acidosis with fluid, electrolytes, and insulin for several hours is an indication for laparotomy.

ANESTHESIA AND PREOPERATIVE MEDICATION

Anesthetic agents should be chosen primarily for the rapid and successful conduct of the operation, their effect on diabetes being a secondary consideration. The principal problem in this respect is nausea and vomiting following the use of ether and cyclopropane, which causes difficulty in metabolic control and further electrolyte losses. Ether anesthesia may be required for relaxation despite its tendency to produce ketosis, vomiting, and glycogenolysis. Spinal anesthesia, alone or with thiopental sodium (Pentothal), was used in 92 of the cases discussed here. Local or regional anesthesia was used in 74 operations. Spinal anesthesia was used for the major amputations and for most laparotomies, and continuous spinal and epidural block anesthesia for extensive abdominal procedures. The levels of blood pressure were regulated by the anesthetist with pressor substances such as phenylephrine hydrochloride (Neo-Synephrine) or methoxamine hydrochloride and levarterenol bitartrate (Levophed) to prevent hypotension, which may cause coronary or cerebral vascular occlusion in patients with

degenerative arterial disease. The use of these agents and of muscle relaxants such as succinylcholine chloride (Anectine) and curare has not appeared to influence the conduct of diabetic control immediately after operation. Thiopental sodium and nitrous oxide-oxygen have proved useful and safe for short operations; when necessary, better relaxation can be obtained with the muscle relaxants. Thiopental sodium was used satisfactorily for eye operations and similar procedures. Nitrous oxide-oxygen was used alone for short operations or for induction of ether anesthesia; it does not cause nausea but does produce anoxia without affording good relaxation. Cyclopropane was used in 34 cases and ether in 32. Combinations of the above anesthetic agents were used in the remainder. Endotracheal administration during 18 operations permitted excellent control for major procedures. Primary consideration must be given to the avoidance of anoxia during general anesthesia. With the use of these agents and methods, each of which has its specific indications, no significant complications have arisen.

Morphine, barbiturates, and atropine sulfate are almost routinely used as preoperative medication, except in certain instances of emergency surgery in the diabetic with ketosis and dehydration. The dosage should be reduced for elderly patients and those with arteriosclerotic disease to avoid central nervous system depression and anoxia. Atropine tends to reduce postoperative nausea. Occasionally, morphine will cause nausea; in such cases meperidine hydrochloride (Demerol) has been substituted.

PREOPERATIVE PREPARATION

The successful management of the diabetic patient depends on the coordinated efforts of the internist, surgeon, and nursing personnel involved in his care. Close supervision of treatment must be maintained to obviate the serious consequences that may arise if an insulin dose is omitted, improper concentrations of dextrose solutions are administered, hypoglycemic symptoms go unrecognized, or ketonuria and impending acidosis are overlooked. Frequent observation of the patient by the physician together with good nursing care will prevent such occurrences or insure their rapid correction.

The well-controlled diabetic patient requires no preliminary period of nutritional repletion and metabolic stabilization. In the acutely ill patient, the luxury of preoperative preparation is often not available because of the urgent need for surgical intervention to prevent further metabolic impairment. When operation is elective, however, many patients not previously well stabilized will be benefited by a period of preparation during which ample protein (1.5 to 2 gm. per kilogram of body weight) and carbohydrate are given to replenish hepatic glycogen, tissue protein stores, and serum proteins while the blood sugar level is maintained within physiological limits by insulin administration. It is often necessary to supplement the diet with vitamins, including B complex, ascorbic acid, and vitamin K. Anemia, if present, is corrected preoperatively by blood transfusion. Fluid and electrolyte losses due to vomiting, suction, or other abnormal conditions are compensated for with dextrose-saline or protein hydrolysate (Amigen) solutions; potassium salts are added if adequate urine volumes have been established. If acidosis is present, sodium lactate solution is administered. The concentrations and volumes of these solutions depend on the measured and insensible losses, the clinical status of the patient, the daily levels of serum sodium, potassium, and chloride, and the carbon dioxide combining power. The fluid intake should be adequate to produce a daily urine volume of 1,200 cc.

The impaired carbohydrate metabolism of the uncontrolled diabetic will interfere with postoperative convalescence in several ways. Body protein may be depleted by gluconeogenesis and by a reduced rate of protein resynthesis, for which insulin is necessary. This is reflected clinically by weight loss, fatigue, hypoalbuminemia, and increased urinary nonprotein nitrogen. In more advanced phases of metabolic disorder the rate of fat catabolism increases, producing an excess of ketoacids that serve as a source of energy for cellular metabolism in the absence of a glycolysis. The excretion of these organic acids results in metabolic acidosis through the removal of fixed base from the body. The accompanying glycosuric diuresis causes dehydration. These alterations may also deplete the liver of glycogen and protein, predisposing it to damage from hypoxia and anesthetic agents.

The cardiovascular status of the diabetic patient requires thorough evaluation because of the incidence of degenerative vascular complications and hypertension. Appropriate therapy for heart failure, angina, or arrhythmias is established preoperatively or postoperatively when these complications appear. If patients with occlusive vascular disease have peripheral gangrene and infection, preliminary treatment with suitable antibiotics is given, and roentgenograms of the affected parts are obtained to detect the presence of osteomyelitis and the extent of vessel calcification; emergency operation is indicated only in the presence of severe and rapidly progressive uncontrolled infection.

INSULIN AND METABOLIC CONTROL

The details of insulin and fluid administration can be outlined only in a general way because of the wide variations of individual requirements. The stabilized patient responds well to minor procedures but may become completely unstable after a prolonged major operation requiring many modifications in the program of treatment. In the presence of severe infection or complications interfering with metabolic stabilization, or in the person in whom diabetes has just been diagnosed and who requires early surgical intervention, the methods employed for the control of the blood sugar level may be entirely different from those described below. The development of modified insulin with an early onset of blood sugar lowering activity that persists for 24 to 30 hours has greatly facilitated diabetic control during treatment for other illnesses.[2] Prior to the production of isophane (NPH) insulin, it was customary to give mixtures of regular insulin and protamine zinc insulin; because of its satisfactory time-activity curve, isophane insulin has replaced these mixtures in many clinics. Frequently, under the stress of operation, the patient temporarily requires regular insulin to supplement this.

2. Shuman, C. R., and Francis, R. B.: NPH Insulin in Diabetic Patients with Complications, Am. J. M. Sc. **222**: 169, 1951.

On the day of operation, depot insulin is administered in doses equal to those used to maintain preoperative stabilization; it is given subcutaneously when parenteral feedings are started to replace meals. Operations should be scheduled for the morning hours if possible so that the first infusion replaces the breakfast carbohydrate; however, patients scheduled for afternoon operations may be given a liquid breakfast and subsequent intravenous feedings. The intravenous feedings replace only the carbohydrate portion of the diet, omitting the estimated available carbohydrate from protein and fat, since these estimates are highly erroneous and appear to have little influence on the insulin requirement during operation. The infusion period extends over 12 to 16 hours, replacing individual meals by regulation of the rate of fluid administration, and is terminated in the late evening if possible. The volume of solution and concentration of dextrose or fructose administered depend on the fluid requirements of the patient, his tolerance based on age and cardiovascular status, and his caloric requirements. To one liter of each day's solution, 3 cc. of vitamin B complex and 0.5 to 1 gm. of ascorbic acid are added. The solutions given during and immediately after operation do not contain sodium chloride unless a cause for electrolyte losses has been present, because of the tendency of patients to retain sodium and chloride after undergoing operation.[3] If intravenous feedings are required for longer than 48 hours, the dextrose concentration of all solutions is increased to 10%, and amino acid preparations are included to increase caloric intake and provide nitrogen. Sodium chloride requirements are met with protein hydrolysate or saline-dextrose solutions in volumes that are sufficient to replace estimated losses. In prolonged intravenous feeding schedules, 3 to 6 gm. of potassium chloride is placed directly into one of the intravenous solutions. Oral feedings are resumed as soon as possible, with liquids such as ginger ale, sweetened tea, fruit juices, and skim milk supplying the carbohydrate portion of the diabetic diet prescription. Under special circumstances, tube feedings are used; a diabetic diet of milk, eggs, skim milk powder, and fruit juices is fed at two-hour intervals throughout the day.

The initial isophane insulin dose is often adequate to maintain diabetic control during the operation; however, additional insulin may be required postoperatively, particularly in patients undergoing major procedures. Supplementary doses of regular insulin are administered when fractional urine sugar values are persistently high and postoperative fasting blood sugar levels are elevated. If dextrose infusions are rapidly administered or if urine accumulates in the bladder for long intervals, the fractional urine sugar method for determining insulin needs postoperatively is not reliable. Regular insulin supplements, when required, are given with the second and third infusions of the day to afford protection from hypoglycemia and at 3:00 a. m. to supplement the overnight action of isophane insulin. On the following day, the isophane insulin dose is increased by about two-thirds of the supplementary amount of regular insulin given during the preceding 24 hours. Usually the supplementary doses vary from 6 to 16 units.

Occasionally there is rapid deterioration of the metabolic status, requiring larger supplementary doses of regular insulin; in these instances, which are characterized by persistent glycosuria and the appearance of acetonuria and hyperglycemia, 12 to 20 units of insulin are administered. One such patient required as much as 100 units of regular insulin every three hours to maintain control during a severe infection for which an operation was performed. In general, it is safer to permit a mild glycosuria and some elevation of the blood sugar level in the early postoperative phase; this is especially true of the cardiac patient. Insulin is given only for 1 or 2% gylcosuria when the patient is protected by some form of feeding, except under unusual circumstances.

During convalescence, reduction of the insulin dosage is often necessary if the dosage was increased during the operative period. This is accomplished by lowering the depot insulin dose when glycosuria is minimal or absent and the fasting blood sugar level is normal. The rate of reduction depends on such factors as the total daily requirement, the clinical status of the patient, and the blood and urine sugar levels. If the dose is lowered too sharply, glycosuria will reappear; in this event, small doses of regular insulin are given with subsequent feedings during the same day. More important, the dose may not be lowered rapidly enough, as demonstrated by low fasting blood sugar levels and persistent aglycosuria; additional interval servings of 150 to 200 cc. of orange juice and/or milk are then given at 3:00 p. m. and bedtime, and the patient is sometimes given a similar feeding at 3:00 a. m. if the urine remains free of sugar. The subsequent depot insulin dose is reduced, the patient being protected by added carbohydrate.

Control Before Emergency Operation.—Immediate operative intervention is occasionally required in patients with acute abdominal disease, severe gangrene with spreading uncontrolled infection, or other acute processes. If the operation is delayed, the acute disease will threaten life and control of the diabetes will become extremely difficult. If diabetic acidosis is present in such a patient, it is treated with an immediate dose of 40 to 100 units of insulin, depending on such clinical factors as previous insulin requirements, degree of fever, toxicity, mental status, and severity of metabolic disturbance. The blood sugar, carbon dioxide combining power, and serum electrolyte determinations are obtained; antibiotic therapy and fluid administration are instituted, with saline solution being used initially. When a lowering of blood sugar to about 250 mg. per 100 cc. or a reduction of urine glucose content is noted, 5% dextrose is administered in sodium chloride solution. The use of regular insulin is continued on a 3 or 4 hour schedule until the condition becomes relatively stable and the 24 hour insulin requirement can be estimated to be given as a single dose of isophane insulin. About 48 to 72 hours may be required for this. Regular insulin is given according to the degree of glycosuria: if acetone is present in the urine and glucose level is 4+, 40 units are given; 3+, 30 units; 2+, 20 units; 1+, 10 units. If acetone is present in trace or absent and glucose level is 4+, 20 units are given; 3+,

3. Moore, F. D.: Bodily Changes in Surgical Convalescence: The Normal Sequence—Observations and Interpretations, Ann. Surg. **137**: 289, 1953.

16 units; 2 +, 12 units; 1 +, 8 units. If glucose is present in trace or absent, no insulin is given; 150 cc. of orange juice may be given. Depot insulin is sometimes given initially if diabetes does not appear to be severe or if the patient has been under control with depot insulin before the onset of the disease requiring operation. Supplementary regular insulin is given in these instances, with the fractional urine sugar level used for estimation of the dose; usually the lower schedule is used if a large isophane insulin dose has been given. It should be remembered that these patients may have been depleted of tissue vitamin stores, potassium, and sodium chloride during the period of uncontrolled diabetes. Vitamins and potassium chloride are added to the intravenously administered infusions as described above for the correction of these deficiencies.

It is usually possible to delay operation for several hours or longer while diabetic management is being instituted; the subsequent stabilization of diabetes is simplified by the surgical correction of the complicating disease. However, the operation is performed as early as possible, usually on the day of admission, in order to remove the threatening complication. During the recovery phase and convalescence, the patient is given a diet based on his nutritional requirements for the restoration of health and return to normal activities. Insulin needs are evaluated during this period as discussed in the previous section. They are invariably much reduced below the initial requirements of the immediate postoperative period.

General Considerations.—Protein supplementation of the diet of poorly nourished patients is often requested. There is evidence that high protein intakes will provide a positive nitrogen balance not achieved by isocaloric feedings with lower, yet normal, protein intakes.[4] The addition of carbohydrate-poor protolysates has not produced any significant alteration of the insulin requirements of stabilized patients, despite the increase in caloric value of the diet; this has been previously observed in clinical studies on diabetes. Likewise, the administration of alcohol orally in 30 to 45 cc. doses three times a day has not influenced metabolic control. As yet, I have not thoroughly evaluated the effect of alcohol given intravenously, because the amount of dextrose given intravenously at the same time as the alcohol necessitates higher insulin doses.

Fructose [5] has been substituted for dextrose for intravenous feeding during and after operation in 20 patients. There has been no reduction in the insulin requirements of these patients, and in two of them marked hyperglycemia and glycosuria appeared postoperatively, requiring supplementary regular insulin at that time and a rapid increase in the isophane insulin doses during subsequent days. Present limited experience does not indicate any advantages in its use as compared to dextrose. The use of fructose has been advocated because of its rapid utilization by the cells by means of a phosphorylative enzyme that does not require insulin for its action. It is known, however, that several pathways for its disposal are available, including conversion to glucose and to glycogen as well as oxidation to carbon dioxide and water. Clinical observations indicate that fructose solutions are utilized effectively by the postoperative diabetic patient; they have permitted no reduction of insulin dosage in these patients, and in the presence of postoperative complications such as urinary tract infection or wound dehiscence, which occurred in two instances, a rise in insulin requirements during fructrose therapy was not avoided.

POSTOPERATIVE CARE

The general care of the diabetic patient postoperatively is of the utmost importance for successful recovery. Early ambulation is encouraged whenever possible. Patients confined to bed must be closely observed to prevent pressure lesions of the back or of the heel. Frequent changing of position, deep breathing, and coughing are encouraged. The fluid intake and output is recorded; the unconsumed carbohydrate portion of each meal is immediately replaced by orange juice. Frequent consultations with the dietetic staff may be required to provide foods that are attractive to the patients. In the treatment of local infections of the extremities, wet dressings at room temperature are applied; débridement with enzymatic factors such as streptokinase or trypsin is often done; neomycin sulfate, nitrofurazone (Furacin), or other antibiotic dressings are applied to infected ulcerations; and, when required, skin grafts are placed over the properly prepared defects. When healing of pedal ulcerations or local amputations has occurred, suitable paddings are arranged for this member and for the opposite foot to prevent pressure areas that will produce recurrent ulceration, infection, and gangrene. In four amputees among the group of patients discussed here, gangrenous changes developing in the remaining foot have necessitated bilateral supracondylar amputation.

Insulin Reaction.—An ever present hazard for the diabetic patient, insulin reactions may be mistaken for postoperative shock associated with reduced blood volume, trauma of surgery, and pulmonary and myocardial infarction. When these reactions occur, the blood sugar level should be determined immediately and 50 cc. of 25% or 50% dextrose solution given intravenously. A satisfactory clinical response to the intravenously administered solution does not confirm the diagnosis of hyperinsulinism, because blood volume and circulatory factors improve after the infusion of hypertonic solution in certain patients who have undergone surgery. In several instances of suspected insulin reaction, the blood sugar level found was over 200 mg. per 100 cc. These patients had improved after intravenous administration of hypertonic dextrose solution. Subsequent blood volume studies revealed abnormally low values, and the condition was permanently remedied by administration of dextran and blood transfusions.

SUMMARY

The diabetic patient is considered a safe subject for any type of surgery when modern methods of anesthesia,

4. Cox, W. M., Jr.; Ellingson, R. C., and Mueller, A. J.: Nitrogen Utilization in Caloric Insufficiency, Pediatrics **11**: 435, 1953. Elman, R.; Davey, H. W., and Kiyasu, R.: Nitrogen Balance on Restricted Caloric Intake, J. Lab. & Clin. Med. **30**: 273, 1945.

5. Beal, J. M.; Smith, J. L., and Frost, P. M.: Studies in the Utilization of Fructose Administered Intravenously in Man, Surgery **33**: 721, 1953. Weichselbaum, T. E.; Margraf, H. W., and Elman, R.: Metabolism of Intravenously Infused Fructose in Man, Metabolism **2**: 434, 1953.

fluid and electrolyte replacement, antibiotic therapy, and control of metabolism and nutrition are used. Such methods were used in the management of 350 diabetics undergoing operations. Cardiovascular disease and infection significantly increase the surgical risk in diabetic patients. The use of isophane insulin, alone or together with other insulins, is advocated because of its rapid and prolonged action. In uncontrolled patients or in the presence of severe acidosis, insulin is given in doses determined by the degree of glycosuria until metabolism becomes stabilized. Intravenous feedings, given before, during, and after operation, replace the carbohydrate content of the diet and also correct dietary deficiencies. Emergency surgery is performed whenever indicated, with no more than a brief delay for the institution of treatment when acidosis is present; further deterioration of the metabolic status may be the penalty for delay. No significant advantage has been found in the substitution of fructose for dextrose in intravenously administered solutions.

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CHLORPROMAZINE AND NARCOTICS IN THE MANAGEMENT OF PAIN OF MALIGNANT LESIONS

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Experimental work by Courvoisier and Fournel [1] has shown that a new phenothiazine compound chlorpromazine (a French generic name for 10-[γ-dimethylaminopropyl]-2-chlorophenothiazine hydrochloride) intensifies and prolongs the action of various drugs, notably narcotics, hypnotics, anesthetics, and muscle relaxants. Clinically, their results have been confirmed by Laborit [2] and by Forster and associates.[3] These investigators have used chlorpromazine preoperatively, during the course of an operation, and also postoperatively as a means of reducing the amount of narcotics, hypnotics, and anesthetics normally required. From the findings of these French investigators, one could expect that chlorpromazine, by augmenting the action of narcotics, might be useful for relieving pain in patients who no longer obtain adequate analgesia from large doses of narcotics; for instance, in those patients with advanced malignant lesions, such a drug would be extremely welcome. This report relates experience with what promises to be such a drug.

Chemically, chlorpromazine is 10-(γ-dimethylaminopropyl)-2-chlorophenothiazine hydrochloride; structurally it is related to the antihistaminic Phenergan (10-[2-dimethylamino-1-propyl] phenothiazine) and to the antispasmodic Diparcol (10-[2-diethylaminoethyl] phenothiazine). Originally developed by Rhone-Poulenc Laboratories in France, the drug was found to be relatively nontoxic and to exhibit diverse pharmacological activities that have been termed "ganglioplegic." [4] The figure shows its structural formula, and table 1 outlines both its physical and pharmacological properties.

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The chlorpromazine used was supplied as Thorazine by Smith, Kline & French Laboratories, Philadelphia.

Because of space limitations, the figure and some of the tables have been omitted from THE JOURNAL and will appear in the authors' reprints.

1. Courvoisier, S., and Fournel, J.: The Pharmacology of Chloro-3 (Dimethylamino-3 Propyl)-10 Phenothiazine Chlorhydrate (R.P. 4560), Arch. internat. pharmacodyn. **92**: 305-361, 1953.

2. Laborit, H.; Jaulmes, C., and Bénitte, A.: Certain Experimental Aspects of Artificial Hibernation, Anesth. et analg. **9**: 232-239, 1952.

3. Forster, S.; Forster, E.; Maier, A., and Blum, H.: Potentialized Anesthesia in Thoracic Surgery, Anesth. et analg. **9**: 250-260, 1952.

4. Laborit, H.: Personal communication to the authors.

MATERIAL AND METHOD

Patients with chronic, severe pain inadequately relieved by large or increasing doses of narcotics were selected for study. A total of 30 patients were observed. All had severe pain, and all but one had cancer. Eighteen patients were hospitalized, while 12 were followed on an outpatient basis. Clinical characteristics of the two groups are listed in tables 2 and 3, respectively. All patients were seriously ill, so that placebos, which would only aggravate their discomfort, were not used. When first given 25 mg. of chlorpromazine orally twice daily, each patient's dosage of narcotics was reduced—in the case of hospitalized patients, it was arbitrarily reduced one-half—and they were asked to judge the resultant analgesia in comparison with that produced by the medicaments given previously. Data on blood pressure, pulse rate, body temperature, and blood cell count were recorded throughout the study. Outpatients were seen at least once a week; hospitalized patients were seen more frequently.

RESULTS

The effects of chlorpromazine on the dose of narcotics required to control pain in the hospitalized patients are presented in table 2. Fourteen of 18 patients, when given chlorpromazine, obtained satisfactory analgesia with dosages of narcotics that had previously been inadequate for relieving their pains; one obtained fair relief; one reported no relief. The two other patients defaulted in taking medication. One (case 6) did not take chlorpromazine after the first day, because he believed the drug caused bad dreams and disturbed his sleep; the other (case 17), in whom no adverse effects occurred, left the hospital after one week and refused to continue treatment.

As shown in table 2, some patients could be comfortable while receiving a lower dosage of narcotics, while others could be comfortable while receiving less potent narcotics than they had previously required. The patient in case 13 had been receiving 10 mg. of racemorphan (Dromoran) hydrobromide every three hours and later reported relief of pain with 5 mg. of racemorphan every seven hours, supplemented with 25 mg. of chlorproma-

zine taken orally twice daily. His need for narcotics was further reduced to 2.5 mg. of racemorphan by increasing the dosage of chlorpromazine to 25 mg. orally four times daily. One patient (case 3) required 5 mg. of racemorphan hypodermically every two or three hours to decrease pains of gastric carcinoma and had become bedridden because of pronounced drowsiness. When given 50 mg. of chlorpromazine intramuscularly every four hours, he obtained satisfactory analgesia with 50 mg. of meperidine (Demerol) hydrochloride given hypodermically every three hours and resumed his semiambulatory status.

Because chlorpromazine has antiemetic properties, it has proved useful in managing patients with nausea and vomiting secondary to carcinomatosis. This effect, reported by Friend and Cummins,[5] was corroborated in our study. Severe nausea, vomiting, and diarrhea were promptly controlled in one patient (case 2) when he received chlorpromazine to augment narcotic medication.

The effects of chlorpromazine on the dosage of narcotics and sedatives required to control pain in the outpatient group are presented in table 3. In some of these patients, nausea and vomiting as well as pain were a problem. In 8 of 10 patients whose pain was unrelieved with large doses of narcotics, the pain was subsequently adequately controlled with lower dosages of narcotics and chlorpromazine. However, of these eight, one later stopped taking chlorpromazine, 25 mg. orally, and codeine, 1/16 grain (4 mg.), because of pyrosis and resumed taking her former medication, of 100 mg. meperidine. Two patients (cases 3 and 7) obtained no beneficial effect. As shown in table 3, singularly good results were obtained in the two outpatients with cancer (cases 11 and 12). Five patients in whom nausea and vomiting were prominent complaints benefited from the antiemetic action of chlorpromazine. Four reported complete relief of nausea and vomiting; the other, though relieved of nausea, reported only a slight reduction in vomiting.

The case of one outpatient (case 6) clearly illustrates the fact that chlorpromazine markedly potentiates the action of drugs that depress the central nervous system. After taking a second dose of chlorpromazine, 25 mg. intramuscularly—two hours after the first dose—the woman took phenobarbital, 1 grain (60 mg.), and became drowsy and cyanotic with moderate respiratory depression. Her pulse rate rose to 164 and her blood pressure fell to 80/44 mm. Hg. Severe dryness of the mouth and drowsiness persisted for 36 hours. In the hospitalized group, one patient (case 9) had a similar experience with a narcotic. After taking 50 mg. of chlorpromazine orally, the patient was mistakenly given 7.5 mg. of racemorphan hypodermically and became semicomatose for 30 hours.

Patients whose pain responded to narcotics plus chlorpromazine, when narcotics alone failed, seemed to be more relaxed and less reactive to their pain. They spoke of their pain as an objective phenomenon; that is, they no longer minded the pain, even though it was still present. This displacement of effect was also observed by us after administering chlorpromazine to patients who were disoriented and excited on emerging from anesthesia. Over-all results with chlorpromazine in the two groups are summarized in table 4. Side-effects occurred as shown in the following tabulation:

Side-Effect	No. of Patients
Drowsiness	11
Dryness of mouth	9
Hypotension	2
Palpitation	2
Pyrosis	2
Dyspnea	2
Oliguria	1
Ataxia	1
Disturbed sensorium	1

Except for drowsiness, side-effects in hospitalized patients were minimal. Ten of 18 patients became drowsy; 5 reported "dry mouth"; and one experienced wild dreams and a disturbed sensorium. Data that the latter was an acute reaction to chlorpromazine were inconclusive; yet, the episode cannot be ruled out as a possible reaction to the drug. Two of the outpatients discontinued taking chlorpromazine, one because of pyrosis and the other because of ataxia and palpitations. Four patients in whom a hypotensive effect was observed had no related symptoms, such as dizziness or fainting. One reported oliguria and two dyspnea. Dryness of the mouth was not bothersome in four patients. Many patients who received chlorpromazine with codeine complained of slight gastric irritation. Chlorpromazine, in the dosages employed, produced negligible changes in blood pressure, pulse rate, body temperature, and blood cell counts.

TABLE 4.—*Results with Chlorpromazine to Potentiate Action of Drug Given for the Relief of Pain, Nausea, and Vomiting*

Problem	No. of Patients Treated	Patient Response		
		Good	Fair	None
Pain	28	22	1	5
Nausea	6	6	0	0
Vomiting	6	5	1	0

COMMENT

Our investigation was conducted to determine whether the potentiating action of chlorpromazine on narcotics and sedatives is useful in managing patients with pain due to advanced malignant lesions and other severe pain. Our results indicate that chlorpromazine given with narcotics significantly reduces the patient's requirement for narcotics and provides equal or better analgesia than high dosages of narcotics alone. This enhanced analgesia is, in part, related to the ability of chlorpromazine to alter the patient's reaction to pain. We observed that patients, some of whom stated that the degree of their pain was not appreciably altered, were more relaxed and had a more cheerful outlook. Patients with nausea and vomiting secondary to disease greatly benefited from taking the drug. Since nausea and vomiting are frequent symptoms in patients with advanced malignant lesions, chlorpromazine thus serves two purposes here.

5. Friend, D. G., and Cummins, J. F.: New Antiemetic Drug: Preliminary Report, J. A. M. A. **153**: 480-481 (Oct. 3) 1953.

Side-effects consisted primarily of drowsiness, dryness of mouth, pyrosis, and mild hypotension. With continued use of the drug, patients required progressively larger doses for a constant therapeutic effect. Whether this was due to the facts that their pain became worse or that tolerance developed could not be determined in this series; yet, when the administration of chlorpromazine was stopped, the patient required larger dosages of the narcotics.[6] The action of chlorpromazine on the central nervous system that we have observed occurred chiefly at the cortical and hypothalamic levels, the principal effect being cortical depression. In sufficient amounts, chlorpromazine produced unconsciousness. Consequently, its use is contraindicated in comatose states caused by barbiturates, opiates, alcohol, and other central nervous system depressants. There is some reason to believe that the drug has peripheral action, because it potentiates the action of curare and the curare-like drugs, such as gallamine (Flaxedil) triethiodide and tubocurarine (*d*-tubocurarine) chloride.[7] Since it also potentiates the action of mephenesin, chlorpromazine may also depress at the internuncial pool. Further studies of chlorpromazine appear indicated to establish its mechanism of action and to study the difference between its effect on somatic and autonomic pain when given with narcotics.

SUMMARY AND CONCLUSIONS

A new compound, chlorpromazine, has proved useful for relieving pain in patients who can no longer be made comfortable with large dosages of narcotics and sedatives alone. When given chlorpromazine with narcotics or sedatives that previously proved ineffective for relieving pain, 22 of 28 patients obtained satisfactory relief from severe abdominal, bone, and neuritic pain associated with malignant lesions. It seems that enhanced analgesia with chlorpromazine is, in part, due to chlorpromazine's ability to alter the patient's reaction to pain.

Chlorpromazine, since it has antiemetic properties, served a dual purpose when nausea and vomiting accompanied conditions of pain. Of six patients with symptoms of nausea and vomiting, five reported complete relief; one, though relieved of nausea, obtained only moderate relief from vomiting. Two patients stopped taking chlorpromazine because of pyrosis and one because of tachycardia and ataxia. Drowsiness was observed to be the most prominent side-effect of chlorpromazine and, to a lesser extent, dryness of the mouth, pyrosis, and mild hypotension.

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6. To be published.
7. Experimental Data, Philadelphia, Smith, Kline and French Laboratories, November, 1953.

DISTURBANCES OF SENSATION IN CHILDREN WITH HEMIPLEGIA

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Major attention has properly been directed at the motor handicap in hemiplegia, but the frequent coexistence of mental defect and convulsions is also well known. The possibilities of significant sensory impairment and of visual defects, however, while well known as a feature of cerebral vascular accidents among adults, have received scant attention in connection with the long-term management of hemiplegia in childhood and young adult life. The standard pediatric, orthopedic, and neurological textbooks largely ignore the subject, which has received only infrequent and relatively recent mention in medical periodicals. Bender [1] mentions its frequency among adult hemiplegics, especially if tested by the extinction method, and a brief preliminary report of our study has already been presented.[2] Detailed testing of sensation and visual fields of hemiplegic children presents technical difficulties, which have doubtless in part accounted for inattention to such features in the past. The difficulties are not insurmountable, however, and, if visual field or sensory impairment cannot be rigorously demonstrated at an initial examination, they may be found on a later occasion if borne in mind and again looked for.

The purpose of the present report is to point out the frequent occurrence of sensory deficits among children with hemiplegia, to show that they may be demonstrated at an earlier age than is often believed to be the case, and to emphasize their practical importance. The possible presence of impaired sensation in the affected arm is highly significant in connection with consideration of physical therapy and orthopedic surgery.

MATERIAL AND METHOD

The 106 patients with hemiplegia were selected from a larger group of children with cerebral palsy who were seen during the past 30 years in the neurological ward of the Children's Medical Center or privately by one of us (B. C.). An attempt was made to reach each such patient by personal letter, and if this was successful the patient was asked to return for a complete reevaluation. The studies carried out included general physical and neurological examinations, studies of sensation and visual fields as described below, psychological evaluation, and, when appropriate, orthopedic consultation, electroencephalograms, motion pictures, audiometry, or consultation with an ophthalmologist, otologist, or speech ther-

From the Department of Pediatrics, Harvard Medical School, and the Department of Medicine, the Children's Medical Center (Drs. Paine and Crothers), and St. Mary's Hospital Medical School, London (Dr. Tizard).

This study was supported by grants from the United Cerebral Palsy Association, by a research grant from the National Institute of Neurological Diseases and Blindness, and the National Institutes of Health, United States Public Health Service (no. B-164).

Edith Meyer, Ph.D., and her associates of the Psychological Division of the Children's Medical Center supplied the psychological evaluation of the patients studied and advice concerning perceptuomotor studies.

1. Bender, M. B.; Shapiro, M. F., and Schappell, A. W.: Extinction Phenomena in Hemiplegia, Arch. Neurol. & Psychiat. **62**: 717 (Dec.) 1949.
2. Tizard, J. P. M., and Crothers, B.: Sensory Disturbances in Hemiplegia in Childhood, Tr. Am. Neurol. A. **77**: 227, 1952.

apist. The sociologic aspects of each patient's status (and his parents', when available) were also studied. When practicable, patients who were in institutions were seen there if they were unable to come (or be brought) in for examination.

The usual types of sensation were tested in the conventional manner, including touch, pain, temperature, position sense, passive motion, vibration, location sense, sharp-dull discrimination, two-point discrimination, stereognosis, and texture recognition. Of these, stereognosis deserves some further comment. It was found in quite variable degree in different patients; some patients had complete astereognosis for such objects as keys, marbles, buttons, or small cubes; others merely made more frequent errors with one hand than the other or errors confined to similar objects such as a cork and a thimble of equivalent size; others showed only inability to distinguish different coins. Care was taken to be certain that any apparent impairment of stereognosis was not kinetic in origin. If an object could not be manipulated well enough by the patient himself, it was moved about and rolled over in his hand by the examiner. When the object is recognized only under the latter circumstances, the situation of course constitutes "astereognosis" for practical purposes, but it was not so designated for the present study. It was sometimes possible to test patients who were unable to speak or who had mental defects by having them point out among a group of test objects in the examiner's hand the object that they had just been given. In no instance was a patient stated to have impaired stereognosis in the hand that was affected by hemiplegia unless this function could be shown to be intact on the unaffected side, as was invariably the case when satisfactory testing was possible. Two-point discrimination was quite simply tested with a bent-open paper clip. It was generally found that stereognosis and two-point discrimination could be satisfactorily tested in an intelligent child of 5 years of age or older.

Sensory testing by simultaneous bilateral stimulation, to look for extinction phenomena such as described by Bender,[1] Critchley,[3] and others, was not routinely done in the present study. Bender [1] reported an increased incidence of diminished sharp-dull discrimination among adult hemiplegics tested by this method (44 out of 50 patients, as compared with only 29 of the same 50 patients by the usual method). Bender has subsequently pointed out that the percentage of error in normal children under 6 or 8 years of age is quite high by this method.[4]

Perimetric examination of visual fields was usually carried out when feasible, although this was not the case with most of the younger or more feeble-minded subjects. When perimetry was not successful, reasonably clear hemianopsia could often be demonstrated by the confrontation method, with simultaneous digital stimulation. Among very young children (below about 5 years old and occasionally in infants) a strong suspicion of the presence of hemianopsia was often obtained by passing coins, steel tape cases, or other attractive objects around the patient's head from behind, while his mother endeavored to attract his gaze in a forward direction. Among patients with hemianopsia, an almost uncontrollable shifting of the eyes toward the side affected by hemianopsia was frequently observed during testing. For this reason the confrontation method of examination, with the examiner using both hands, is likely to be more reliable than perimetry.

RESULTS

Impairment of sensation was found in about 50% of the cases, both among those with hemiplegia presumably acquired at birth (i. e., recognized in early infancy without conceivable postnatal cause, and usually with a plausible history of brain damage at birth), and among those with hemiplegia acquired later in childhood. Impairment was found slightly more frequently among the latter group. Hemianopsia occurred less often, its incidence being slightly less than 25%, and hemianopsia without sensory deficit was very rare. Detailed figures are given in table 1.

TABLE 1.—*Occurrence of Hemianopsia and Sensory Impairment in Persons with Hemiplegia*

Condition	Patients with Acquired Hemiplegia	Patients with Birth Hemiplegia
Hemianopsia plus sensory impairment	11	11
Sensory impairment only	10	15†
Hemianopsia only	2*	1‡
Neither hemianopsia nor sensory impairment	19	30
Total	44	62

* Plus 2 cases with hemianopsia but sensory examination unsatisfactory.
† Plus 2 cases with sensory loss but visual examination unsatisfactory.
‡ Plus 3 cases with hemianopsia but sensory examination unsatisfactory.

The types of sensation affected are given in table 2. It will be noted that those most frequently affected are the cortically localized discriminatory faculties. Stereognosis was the single ability oftenest impaired, although occasionally a slightly elevated threshold of two-point discrimination (perhaps 1.5 cm. as compared with 0.75 cm. on the unaffected side) was found in the absence of even partial astereognosis. Other types of sensation were never found to be affected in the absence of impaired stereognosis and two-point discrimination. It will be noted that position sense, touch pain, and temperature were more frequently affected among persons who had acquired hemiplegia than in the group with congenital hemiplegia, among whom impairment was most often confined to stereognosis and two-point discrimination.

TABLE 2.—*Types of Sensation Impaired by Hemiplegia*

Type of Sensation Impaired	Patients with Acquired Hemiplegia	Patients with Birth Hemiplegia
Stereognosis	20	24
Two-point discrimination	14	18
(Two-point discrimination but no stereognosis)	(1)	(3)
Position or passive motion sense	15	7
Sharp-dull discrimination	8	3
Light touch	8	1
Pain	8	3
Temperature sense	4	1

The hemianopsias found were invariably of the homonymous type, and ipsilateral to the side of the hemi-

3. Critchley, M.: The Phenomenon of Tactile Inattention with Special Reference to Parietal Lesions, Brain 72: 538, 1949.
4. Fink, M., and Bender, M. B.: Perception of Simultaneous Tactile Stimuli in Normal Children, Neurology 3: 27, 1953.

plegia, as would be expected. Examination of the visual fields by use of a perimeter or tangent screen sometimes showed sparing of the macular area. It has already been mentioned that patients who have hemianopsia tend to show an almost uncontrollable lateral shift of the eyes toward the hemianopic side, if the visual fields are tested

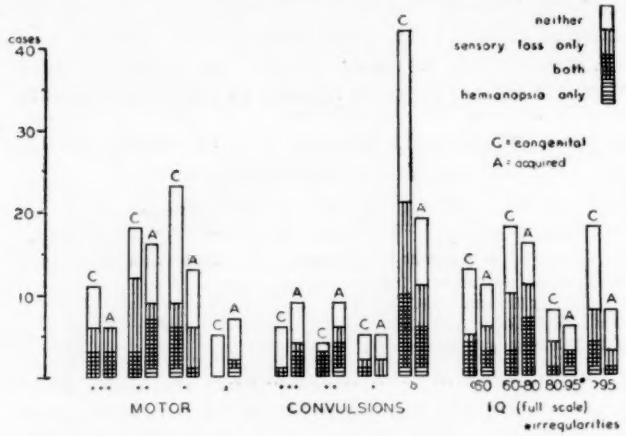

Fig. 1.—Sensory loss and hemianopsia in relation to severity in other respects.

with a single test object, as in perimetry. This phenomenon may in many instances account for apparent "macular sparing."

It was striking that the severity of the sensory involvement was not correlated with the severity of motor disability (except in those patients who had essentially no motor residue), the degree of muscular underdevelopment on the affected side, mental status, or the frequency or severity of convulsive seizures. Details are presented in figure 1. There were examples of patients with very small, "atrophic" arms with severe contractures, but no impairment of sensation, and conversely of patients with only minimal motor disability, no contractures or underdevelopment, but very extensive sensory deficits. Among the latter group, impaired sensation was sometimes the major reason for disuse of the arm, a situation of which the practical importance will be discussed below.

A definite relationship seemed to exist between skeletal undergrowth (i. e., bony shortening as opposed to merely muscular underdevelopment) and sensory defects. Unfortunately, measurements of the length of the limbs, in addition to circumference, were not carried out in every case, and in some of the other cases such measurements were impossible to obtain because of athetoid movements, severe contractures, or lack of cooperation. When present, the shortening was usually most obvious in the forearm and hand, sometimes in the foot, but very seldom in the thigh or leg. "Undergrowth" seems a more rational term than "atrophy," inasmuch as the process is one of failure of development rather than of retrogression. Data concerning patients on whom accurate limb length measurements are available show that, of those with undergrowth of the upper extremity, 14 had sensory loss in the hand and 2 did not; 14 had hemianopsia and 6 did not. Of those with no undergrowth of the upper extremity, 2 had sensory loss in the hand and 10 did not; 2 had hemianopsia and 12 did not. Of the two who had no undergrowth of the upper extremity but had sensory loss in the hand, both had undergrowth of the foot on the affected side and only minimal cortical sensory loss in the affected hand.

It should be noted that, of 16 patients with undergrowth, none had both normal sensation and full visual fields, while of 12 patients with no undergrowth of the affected arm, 10 had both normal peripheral sensation and full visual fields.

Sensory impairment was almost as common among patients with "congenital" hemiplegia as among those whose hemiplegia was acquired later and bore no correlation with the age at its acquisition in the latter (fig. 2). Ruch, Fulton, and German,[5] studying roughness, weight, and shape discrimination in human beings and in chimpanzees after parietal lobe lesions, found that considerable return of function (or retraining) took place with the passage of time. This possible correlation of time interval between the onset of hemiplegia and the date of reexamination of the patient could not be assessed in the present study, since serial sensory examinations were not available, and in most instances the time interval was quite long. In earlier examinations, we, as well as other physicians, almost uniformly overlooked the sensory impairment, failing either to test for it or to find it.

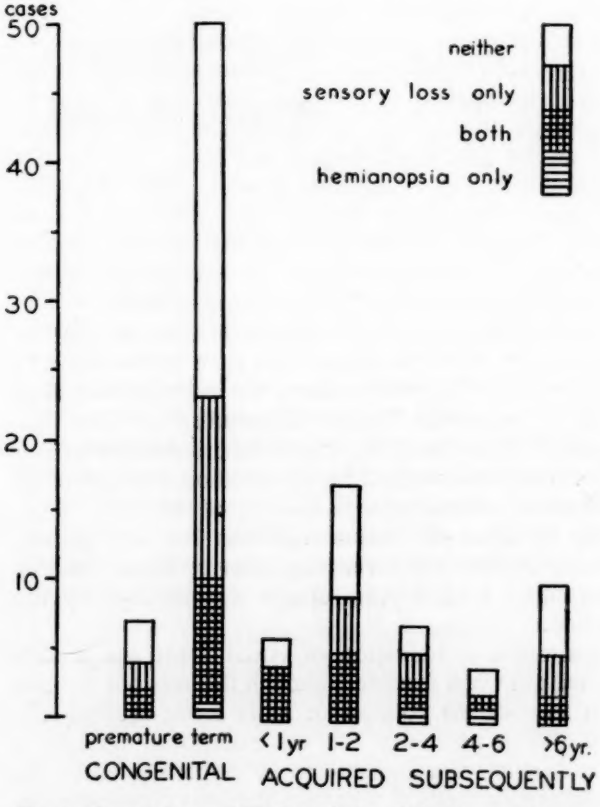

Fig. 2.—Sensory loss and hemianopsia in relation to age at onset of hemiplegia.

Because of the often-expressed hypothesis that hemiplegia is in many instances due to thrombosis of a major portion of the middle cerebral artery, great effort was made to determine whether there was a correlation between the presence or absence of visual or sensory deficits and such factors as the apparent causes, manner of onset,

5. Ruch, T. C.; Fulton, J. F., and German, W. J.: Sensory Discrimination in Monkey, Chimpanzee, and Man After Lesions of the Parietal Lobe, Arch. Neurol. & Psychiat. 39: 919 (May) 1938.

presence or absence of convulsions, and aphasia at onset. No correlations were found, however, and no conclusions could be drawn from this study. There was, however, some correlation between visual and sensory deficit and the presence of occipital or parietal porencephaly or severe localized dilatation by pneumoencephalography, as well as with the absence or marked decrease in voltage of the contralateral occipital alpha rhythm in the electroencephalogram. The correlation was not absolute, on the other hand, and in some instances it was paradoxical, as shown in the following tabulation:

Impairment	Occipital Porencephaly	Parietal Porencephaly	Absent Alpha Rhythm
Hemianopsia plus sensory impairment...	3	1	3
Hemianopsia only	2	1	2
Sensory impairment only.....	1	1	2
Neither visual nor sensory deficit.....	1	1	1

A theoretical point of some interest is whether astereognosis might in fact represent a disturbance in recognition of forms and shapes similar to the perceptuomotor difficulties, well known to psychologists, that are commonly found in patients with brain injury. Such difficulties, in tests of block design, picture completion, design memory and reproduction, were present in most of the hemiplegic patients studied and showed no correlation with astereognosis or other defects of sensation.

As has been mentioned, in cases in which the motor disability and degree of underdevelopment were mild, the impairment of sensation was sometimes the principal reason for disuse of the affected arm and hand. It is obvious, of course, that even minimal motor impairment will usually produce enough awkwardness to cause the patient to prefer the opposite hand. Nevertheless, in view of the strong pressure in school and elsewhere for right-handedness, which was more widespread in years past than at present, it is of interest that, among 59 patients with hemiplegia on the right side, in 22 of whom the motor disability was very mild, only 2 are right-handed. One of these, who has had hemiplegia since birth, is really ambidextrous. In the other, hemiplegia appeared at the age of 16 months, after an upper respiratory infection with fever and convulsions, and this patient is now right-handed despite partial astereognosis as well as a mild motor disability.

The present series includes four patients who have had transplantation of the flexor carpi ulnaris tendon. Three of these have sensory impairment in the affected hand, which in each instance was unrecognized at the time of operation. It is of interest that a really successful result, with increased usefulness or permanent cosmetic benefit, was obtained only in the patient with no sensory deficit (case 4).

REPORT OF CASES

CASE 1.—The patient, a 14-year-old boy, was born prematurely, at eight months' gestation, and weighed 3 lb. 2 oz. (1,363 gm.). His mother had had toxemia since the fourth month of pregnancy. He was born by breech extraction and was apneic and cyanotic at delivery but was resuscitated with some difficulty. The presence of hemiplegia was recognized by disuse of the right arm as early as 4 months of age. The transplant operation, done at 7 years, produced what seemed to be a good immediate cosmetic result, but the boy did not use the arm any more than formerly, and the correction is described as having "slipped back." At 14 years, he had marked astereognosis and diminished two-point discrimination and position sense. The elbow pronation and wrist flexion contractures recurred, and typical hemiplegic posture of the arm was present. Psychological testing disclosed poor spatial orientation, poor memory for design, and impaired learning processes, with an intelligence quotient (I. Q.) of approximately 83.

CASE 2.—The patient, a 16-year-old boy, was said to have had a "birth injury," but the details are not clear. Right hemiplegia was recognized early, mainly because of slow motor development (he did not sit until he was almost one year old and walked at 20 months). The tendon transplant was carried out at 9 years of age, but both the boy and his parents described the arm as less useful than before. Reexamination at 16 years of age showed a typical hemiplegic arm with contractures and almost complete astereognosis of the right hand. Psychological testing disclosed poor memory for designs, poor form organization, slow learning, and discrepancy in verbal and nonverbal ability (verbal I. Q. 90, performance 65, full-scale I. Q. approximately 75 to 80).

CASE 3.—This patient, a 21-year-old woman, had been entirely normal until the age of 2 years and 4 months. A minor fall occurred at that time, followed by a generalized convulsion two hours later, with immediate complete right hemiparesis and aphasia. The facial palsy subsided in a few weeks, but the other features of hemiplegia persisted. Tendon transplant was done when the patient was 17 years of age. The patient believed the operation was useful from a cosmetic point of view, although the hemiplegic posture of the arm was obvious, and she did not use the arm. Sensory examination showed decreased stereognosis, position and texture sense, and two-point discrimination. Psychological testing showed the patient to have an I. Q. of 120, but poor memory for design, and difficulty in organization of form material.

CASE 4.—A 15-year-old boy had hemiplegia on the right side that presumably dated from birth (when he was held back for some time to await the physician's arrival) although disuse of the right side was not clearly recognized until the boy was 15 months of age. Tendon transplant at 9 years of age produced a definite cosmetic improvement and probably rendered the arm more useful, although it was still used mainly to hold objects to be manipulated by the left arm. There was no sensory loss in the affected hand. There were no perceptuomotor difficulties at the time of psychological evaluation, and the patient's I. Q. was about 114.

COMMENT

Sensory disorders are frequent and important in hemiplegic children. The responsibility of one of us (B. C.) for repeated failure to recognize these disorders is admitted. The fundamental mistake, of course, was the failure to reinvestigate the situation as the children grew up. Many of these children did not return after an initial visit in infancy. There was, however, no consistent warning to parents or referring physicians that sensory reexamination should be carried out at a later time. Other children were treated by physical therapists or in orthopedic clinics without due warning. Obviously some of these children were seen at an age when careful testing should have been possible.

A wide inquiry among other workers in many communities suggests that our error is not unique. The facts justify the statement that no examination of a child with hemiplegia should be accepted as complete without a definite note that sensory loss has been searched for. Furthermore, no child who has hemiplegia should have operations on the affected arm without such testing. Finally, the question of whether a person may be driving an automobile while suffering from hemianopsia should be carefully considered.

SUMMARY AND CONCLUSIONS

Of 106 persons with hemiplegia acquired at birth or later about half of each group were found at follow-up to have some type of sensory impairment on the affected side, including most frequently total or partial astereognosis, or diminished two-point discrimination. The extent of the involvement was usually greater in the group with hemiplegia acquired subsequent to birth. Homonymous hemianopsias were present in approximately 25%, almost all of whom also had sensory deficits. The presence or absence of sensory impairment or hemianopsia showed no correlation with the degree of motor disability or muscular underdevelopment, with the mental status, the presence or absence of recurrent seizures, nor the age of onset in the case of hemiplegia acquired subsequent to birth. Close correlation with bony undergrowth of the affected arm existed, however. Psychological study disclosed perceptuomotor difficulties among most patients. Occipital or parietal lobe porencephaly or absent occipital alpha rhythm were usually associated with visual field or sensory defects.

Earlier examinations of these patients had almost uniformly failed to reveal the visual or sensory loss. Testing is feasible at a much earlier age than is generally believed to be the case. The sensory impairment is in some instances the major reason for disuse of the arm that is affected with hemiplegia, and if present is important in constituting a limiting factor for the results that may be expected from physical therapy, apparatus, or orthopedic surgery. Hemianopsia, if present, is of lesser practical importance but poses definite problems.

300 Longwood Ave. (15) (Dr. Crothers).

DESCRIPTION AND TREATMENT OF HEART DISEASE DUE TO ANXIETY

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Today cardiovascular diseases rank first in America as a cause of death; almost one-third of the population dies of disorders involving this system. Yet, despite this high incidence, many persons complaining of heart trouble have no detectable organic cardiac disease. Austin Flint wrote in 1870: "Of the persons who make complaint of symptoms referable to the heart, the great majority suffer from a functional disorder only." According to Lewis,[1] 90% of the patients admitted to the British Army cardiac hospitals during World War I had no organic heart disease. Wheeler and others [2] state that 5% of the general population have cardiac symptoms with a functional basis at some time during their lives. An early description of the symptoms of a common type of functional cardiac disorder is found in the case of Wm. Henry H., which, although recorded 90 years ago during the Civil War, is still pertinent to this syndrome today.

> Sometime before the battle of Fredericksburg, he had an attack of diarrhea; after the battle, he was seized with lancinating pains in the cardiac region, so intense that he was obliged to throw himself down upon the ground, and with palpitation. These symptoms frequently returned while on the march, were attended with dimness of vision and giddiness, and obliged him often to fall out from his company and ride in the ambulance. Yet he remained with his regiment until July 4th, 1863, when he was wounded at the battle of Gettysburg. The wound healed in about one month; but the cardiac symptoms became worse, and violent palpitations ensued upon the slightest exertion, sometimes also whilst in bed, obliging him to rise. There was soreness in the cardiac region, and a constant dull pain.

Wm. Henry H. was one of the 300 patients with similar complaints that Da Costa observed during and after the Civil War. He named the condition "irritable heart" on the basis of the altered heart action and the precordial discomfort. Since that time, the syndrome has been rediscovered with each succeeding war.[3] Da Costa[4] felt that organic heart disease and irritable heart "were in reality one, or rather that one grew out of the other." His appraisal of the apparent causes of an irritable heart showed rigorous army duty, diarrhea, and fever producing 86% of the cases. The diarrhea often was self-limiting and related to ensuing combat and ceased before the patient was hospitalized for his cardiac complaints. The anxiety-producing factors were sufficient to cause palpitation in any person. In other patients cardiac symptoms developed after such exertion as "a march of 26 miles in one day" and "fighting and marching for 3 days." In attempting to explain the nature of the malady, Da Costa postulated that as a result of overaction and frequent excitement the heart becomes "irritable" and that this hyper-responsive state persists owing to a disordered innervation.

For 45 years after Da Costa's paper appeared, the syndrome as described excited little interest; with the first world war, it was again reported by numerous authors.[5] The cardiac origin of the disorder was questioned because of the prominence of other symptoms, such as a lack of stamina, inability to sustain effort, and rapid fatigue. Other causative factors, such as infection, hyperthyroidism, and anxiety, were considered. It was also noted that the symptoms of an irritable heart were rarely seen in the severely wounded and ceased to appear with

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any frequency within a week after the cessation of hostilities. The observations made on patients during World War I led to an increasing awareness of the emotional factors in this illness. The question was raised whether the syndrome, variously called irritable heart, effort syndrome, or neurocirculatory asthenia, was a clinical entity. Regarding the cause of this condition, Wilson [6] in 1916 cautioned, "Many tempting views suggest themselves, but few stand the test of further observation." Between the world wars little was published on the subject. Wood [7] in 1941 reported a thorough evaluation of the signs and symptoms of the syndrome. His conclusions supported an emotional origin, with the excessive autonomic response resulting from fear, whether in civilian or soldier. Friedman in 1947 named an imbalance between the cortex and hypothalamus as the primary difficulty. This imbalance could arise through either hereditary predisposition or extreme stress in a normal person. When patients with functional cardiovascular disease were compared with those suffering from acute or chronic anxiety, Friedman found no essential or basic differences in the psychic, somatic, or visceral symptoms and signs of each disorder. The studies of Cohen and others [8] revealed a definite familial incidence in this syndrome with an almost Mendelian hereditary pattern. If both parents have the disorder, about 61.9% of the offspring will be so afflicted.

In 1950, a 20 year follow-up study of 173 patients with neurocirculatory asthenia by Wheeler and others [2] led to the conclusions that the disorder is chronic and does not cause death and that "simple reassurance and the passage of time" are as effective as more prolonged or drastic methods of treatment. An important observation reported in this paper was that anxiety does not increase the incidence of organic disease.

Because of the clinical and physiological similarity of anxiety and functional cardiac disorders, we propose the name "anxiety heart disease" as most descriptive of the condition, which we define as a state of acute or chronic anxiety in which the patient's attention is focused on his heart. The anxiety is held to be the primary disorder, since no consistent organic cardiac disease has been found and the cardiac symptoms are only a part of the syndrome. The diagnosis of heart disease is more likely to rest on the patient's fears than on the physician's findings. Heart disease due to anxiety may be created by unwarranted emphasis on some equivocal cardiac finding in a susceptible patient; an anxious patient, being unduly concerned about himself already, may become obsessed with the fear of sudden death or a "heart attack" after being told he has a murmur or a fast heart. The patient who is not anxious either dismisses the admonitions about his heart or consults additional physicians until he is sufficiently reassured to overcome whatever fears may have been produced by the reference to heart disease.

CLINICAL DESCRIPTION

Cohn [9] described the patient's appearance as follows: "The brow is furrowed, the eyes are troubled, the mouth is drawn." The patient is painfully aware of himself and interprets each minor discomfort as an ominous sign of some undiagnosed and dread disease. The symptoms are not directly related to exertion, since they occur both at rest and during activity. The heart does not show an increased response to epinephrine, nor is there a decreased vagal tone. The sweating has the same distribution seen in other emotional disorders. The breathlessness does not result from a diminished vital capacity, an increased circulation time, or an increase of carbon dioxide in the blood. The irregularities in the spirometric tracings are similar to the changes recorded in the anxiety neuroses.[10]

TREATMENT

Since anxiety-based heart disease is defined as a syndrome in which the patient has physical symptoms that he attributes to cardiac disease although no evidence of cardiac disease exists, treatment consists of relieving the anxiety. These patients are unable to accept the pronouncement that they are free from heart disease, because they continue to have palpitations, precordial pain, and dyspnea. As in other disorders, the physician prescribes on the basis of his findings and impressions and must not be led into treating the patient's diagnosis, regardless of the insistence of the complaint. The syndrome of anxiety is as understandable and recognizable as other complaints if it is sought for and clarified; the absence of organic change does not mean that there is nothing wrong with the patient. As fever is rationally controlled only by discovering and eliminating its cause, so the relief of anxiety depends on an understanding of the factors that produce it. Treatment consists of decreasing tension. It deals with the relief of concern over self and the reestablishment of the patient's confidence in his own well-being, and its progress is objectively measurable in a decreasing tendency to autonomic over-response. In most instances the faith and confidence of the patient in his doctor's judgment will relieve the fears that arise over somatic ills. There is as much therapy in the giving as in the taking of most medicaments, and much of the relief afforded by any treatment depends on relieving the patient's apprehension as well as on the specific effects of the medication.[11]

Any explanation of his symptoms to the patient must be brief, clear cut, and in no way ambiguous. No remark made by his physician is casual to a patient with this syndrome, and the recitation of a similar case is not beneficial. Silence is the reassurance of choice, because it allows the patient to proceed with the history, which itself often provides explanations that disqualify absurd fears. Verbal reassurance should be minimal; the fact that the symptoms are not repeatedly discussed, no restrictions are imposed, and no medication for the heart is given is ample reassurance to most anxious patients. Few persons are sufficiently interested to listen to an-

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9. Cohn, A. E.: The Cardiac Phase of the War Neuroses, Am. J. M. Sc. **158**: 453, 1919.

10. Kerr, W. J.; Dalton, J. W., and Gliebe, P. A.: Some Physical Phenomena Associated with Anxiety States and Their Relation to Hyperventilation, Ann. Int. Med. **11**: 961, 1937.

11. Smith, J. A.: Method of Treatment of Symptoms of Conversion Hysteria, South M. J. **45**: 625, 1952.

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other's troubles without interrupting to describe their own difficulties; therefore, the doctor must not interpose any detailed descriptions of his own current or past disappointments while he is treating a patient with heart disease due to anxiety. The patient has usually been repeatedly reassured by his family and friends, but he appreciates their lack of qualifications for deciding whether he has heart disease.

In this syndrome the cardiac symptoms are but one feature of the anxiety. Other less dominant but still disturbing symptoms, such as tension headache, paresthesias of the hands and feet, and insomnia, should be sought. The entire tension syndrome and symptoms referable to the respiratory, genitourinary, and central nervous systems should be discussed in detail to see how many other discomforts the patient has experienced. This questioning regarding other systems serves two purposes: it deemphasizes the importance of the cardiac symptoms, and it increases the patient's confidence in the doctor's understanding of his condition. Only after all the systems have been checked and all the complaints heard should the statement be offered that the patient's symptoms could arise from tension. The patient should be told that it is understood that his symptoms are not imaginary and that he is unquestionably more uncomfortable than he has ever been before; he will usually be in complete agreement with these statements, and this is the time to add that the symptoms do not indicate any cardiac disease or injury. The physician should explain further that anxiety is not a rare or unusual state, that it produces no physical damage in the patient, and that the prognosis is good. The patient should be forewarned that recovery is gradual rather than dramatic and that he should expect occasional bouts of discomfort. It should also be pointed out that most of his symptoms are not connected with his cardiac function. Enumeration of the symptoms that accompany anxiety, including apprehension and fear of insanity or death, makes the patient aware that his true status is appreciated.

Psychotherapy.—The treatment of emotional disturbances, like other medical procedures, aims at restoration of function and a return of the patient to his premorbid state. The more chronic the condition and the less adequate the patient to function without some symptom to keep him occupied and fill the blanks in his conversation, the more difficult the treatment will be. The particular system or area involved in a functional complaint is not of prime importance in treatment except as it may indicate to the physician the unpleasant task from which the patient wishes to escape gracefully and medically, as in dyspareunia in a frigid wife. Since functional disorders are not based on organic change, treatment of the symptoms is doomed to failure, because there is no physical disorder to remedy. Treatment of such a complaint can be successful only on a basis of suggestion or on the presumption that a disease exists that is not yet clinically manifest; the latter approach is the ultimate in preventive medicine. Yet it is admittedly difficult to ignore the symptoms in a distraught, demanding patient, even though no cause for them can be found.

In an emotional, functional, or psychosomatic illness or in organic disease aggravated by these factors, the cause must be sought in some interpersonal or intrapersonal difficulty that the patient has experienced. Usually he will be involved in a situation that he cannot alter without a personal loss too great to make the solution acceptable. For instance, a patient may hate the man with whom he works and still be unable to forego the security of his job. A wife may find her husband dull, yet be reluctant to sacrifice the comfort that his financial status assures for a more interesting but less solvent friend. Regardless of the patient's personality type, the individually disturbing factors must be clarified.

Another factor in the development of symptoms based on anxiety is the occurrence of an illness in an acquaintance. The closer in age, background, and activity the afflicted person is to the patient, the more likely the patient is to fear a similar fate. The anxious man in his fifties who reads of another person's having a "heart attack" checks first the victim's age, next his occupation, then the circumstance in which the illness occurred—and finally his own pulse. As patients become older they become increasingly aware of their hearts.

Anxiety may arise from an unsolved conflict that creates unexpressed anger and resentment. The conflict may occur in any area of the patient's activities; most often it will arise in his home or in his work. Many persons will tolerate imposition and abuse to avoid argument and disharmony. The presence of a critical, unappreciative relative in the home (a mother-in-law) whom the husband must tolerate to preserve his marriage may be a chronic source of concealed irritation causing an eventual state of acute anxiety.

Presumably the patient has either failed in his relationship with other persons or succeeded in adjusting to others only after such a sacrifice of self-esteem that he can no longer tolerate himself. With chronological maturity, the normal accumulation of responsibility and a particular standard of living progressively limit the uninhibited expression of a dissenting opinion. A man may express his dissension only with consideration of the consequences of his action, including the effects on those who are dependent on him. Therefore, security is usually gained through a considerable surrender of spontaneity.

Many functional disorders arise from changes in the patient's environment that he cannot alter without jeopardizing his security. An instance is the person who feels discriminated against when another employee is given a promotion that he feels he should receive. He has impulses to "tell them what he thinks of the situation," to quit the job, to complain to his boss, or to accept the situation outwardly and damn his superior in the safety of the company of his friends. He can successfully preserve his opinion of himself by deciding that he is accepting the wrong only for the sake of his wife and children, but the presence of the person who received the disputed promotion may give him cardiac palpitation, tachycardia, and fear of a "heart attack." It is unlikely that he will be aware of the connection between the symptoms and the disliked person.

It must be stressed that what disturbs the patient may seem rather unimportant to the physician, to whom a solution to the problem may be immediately evident. It should be remembered, however, that any solution must come through the patient's efforts, using whatever capacities he has, and also that any advice given must be on this basis.

SUMMARY

The treatment of heart disease due to anxiety consists of relieving the patient's anxiety and his cardiac awareness. Some long-standing or recent conflict is sought; the tension and anger connected with such conflicts are expressed, and their relationship to the palpitation, tachycardia, and weakness is pointed out.

SYSTEMIC DISEASE AND THE CARPAL TUNNEL SYNDROME

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Median nerve compression in the volar carpal tunnel (the carpal tunnel syndrome) has been recognized as an effect of trauma [1] and has been ascribed in two reports [2] to the tenosynovitis of rheumatoid arthritis. There have been numerous reports [3] describing the spontaneous development of the carpal tunnel syndrome without known pathogenesis. We have recently observed five patients with a bilateral median neuritis as the first manifestation of amyloid disease, both primary and secondary, and one clearly defined case of rheumatoid arthritis complicated by a bilateral median neuritis. It is the purpose of this report to call attention to the importance of underlying disorders that, in the absence of trauma, may lead to the carpal tunnel syndrome.

REPORT OF CASES

CASE 1.—A 54-year-old school teacher was in excellent health until the summer of 1951 when peculiar sensations were noted in the right thumb, followed shortly by tingling pain and numbness in the first three fingers and the radial half of the fourth finger. Six months later, her left hand was similarly involved but to a lesser degree, and low back pain developed that radiated down the back of the right leg. When the patient was first seen eight months after the onset of symptoms, the skin of the first three fingers showed edema bilaterally and was shiny, and there were flexion contractures of the right third, fourth, and fifth fingers. The volar surfaces of the wrists were swollen and tender. The thenar muscle groups of both hands were atrophied; the right hand was worse than the left. Pinpricks and light touches on the first three fingers were scarcely felt by the patient.

Laboratory study showed no abnormalities in the blood cell count, an erythrocyte sedimentation rate of 43 mm. in one hour (Westergren) and protein in the urine (4+). The conventional test for Bence-Jones protein in the urine was repeatedly negative. Electrophoresis of the urine with filter paper, however, showed a very heavy spot in the area of gamma globulin; with serum, electrophoresis showed a spot of faint intensity in the same location. The serum albumin was 4.6 gm. per 100 cc. and the serum globulin was 2.2 gm. per 100 cc. (Howe method). X-ray films of the skull and pelvis showed multiple areas of destruction. Films of the wrists and fingers showed no abnormalities. The amount of plasma cells in aspirated bone marrow was increased to 10%; these cells were immature, and they supported the diagnosis of plasma cell myeloma.

Because of intractable pain in the median nerve distribution of the patient's right hand, a surgical exploration of the carpal tunnel was performed. The nerve was sharply constricted the width of the transverse carpal ligament. The flexor tendon sheaths were greatly thickened; they were tough and a grayish-white. The median nerve was released by cutting the transverse carpal ligament. Sections of the tendon sheaths stained with hematoxylin and eosin were examined microscopically. The picture was that of a dense, fibrous-like, afibrillar tissue with a great number of elongated fusiform nuclei and with no infiltration of lymphocytes or plasma cells. A few foreign body giant cells were seen. Periodic acid Schiff,[3a] cresyl violet, and congo red stains were taken up in homogenous sheets of amyloid-like material.

The pain in the right hand was not affected by the operation. During subsequent months a marked anemia and mild nitrogen retention developed in the patient, and she died in May, 1953. An autopsy verified the diagnosis of plasma cell myeloma. Amyloid was found in the walls of the small arteries of the pancreas, adrenal glands, and lungs and in the muscular layer of the wall of the stomach. The liver, spleen, and kidneys failed to take up congo red dye. The kidneys showed no amyloid material, but they showed signs of a severe Bence-Jones nephrosis. This patient had plasma cell myeloma with secondary amyloid disease in the bizarre distribution previously described in plasma cell myeloma.[4] The flexor tendon sheaths, thickened by amyloid, crowded the median nerve against the transverse carpal ligament.

CASE 2.—A 59-year-old housewife was in good health, except for "nervous tension," until the fall of 1950, when numbness and shooting pain suddenly developed in the first three fingers and radial half of the fourth finger of the right hand. Within

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Dr. John M. Baldwin Jr. gave permission to present the material in case 1. Dr. Raffaele Lattes and Dr. Gabriel Godman made the study and interpretations of the histopathological material.

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four months, identical symptoms were noted in the left hand. She was wakened nightly with intense pain in the first three fingers of one or both hands. Aspirin and cortisone failed to give relief. The first three fingers of both hands became moderately swollen and the skin became tense and shiny. The abductor pollicis brevis and the opponens pollicis were weak. There was loss in pain and light touch sense over the median nerve distribution of both hands.

Laboratory examination showed a normal blood cell count and erythrocyte sedimentation rates between 25 and 53 mm. in one hour (Westergren). The first urinalysis showed a plus-minus proteinuria. The streptococcic agglutination and the differential sensitized sheep cell agglutination tests were negative. Roentgenograms of the wrists and fingers showed no bony abnormality.

Both carpal tunnels were explored surgically, and in each the median nerve was flattened against the transverse carpal ligament by an extensive tenosynovitis. A tough beefy tissue surrounding all the tendons was stripped away. The pathologist reported dense fibrous tissue. The patient's fingers were free from pain within 48 hours after the operation. Two weeks after the operation, however, diffuse aches developed in both shoulders. The left trapezius was obviously swollen. There was tenderness over poorly outlined indurations in the trapezius muscles. The patient was referred to us with the diagnosis of rheumatoid arthritis.

Because of the lack of constitutional symptoms, the two year course with no definite pathological joint conditions, and the lack of remission of the symptoms with cortisone therapy, the diagnosis of rheumatoid arthritis was held in some doubt. Further study showed normal blood pressures, a slowly increasing proteinuria, a nonprotein nitrogen level of 23 mg. per 100 cc., urine concentration to 1.020, and phenolsulfonphthalein excretion of 40%. Filter paper electrophoresis of the serum showed slightly increased beta globulin; the same study of the urine showed a heavy abnormal spot in the alpha 3 range, i. e., equidistant between alpha 2 and beta. This pattern has not been seen previously and is different from any patterns found thus far in our patients with plasma cell myeloma.[5] The serum albumin was 4.3 gm. per 100 cc., globulin 2.2 gm. per 100 cc. (Howe method), and calcium 9.5 mg. per 100 cc. Seventeen per cent mature plasma cells were seen in bone marrow aspirations. An x-ray skeletal survey showed no abnormalities. Microscopic sections of the thickened tendon sheaths from the wrist operations were stained with periodic acid Schiff,[3a] cresyl violet, and congo red dyes. The uptake of dyes was individually smooth, diffuse, and typical of amyloid.

The numbness, edema, and flexion contractures of the fingers slowly cleared over a three month interval.

This patient is thought to have primary amyloid disease, so far recognized only in tendon sheaths. The extensive amyloid tenosynovitis in the carpal tunnels compressed the median nerves and produced a severe neuritis. The heavy proteinuria, which is due to an abnormal globulin level, does not seem to be related to any primary pathological renal condition. The increased number of mature plasma cells in the bone marrow remains unexplained. The diagnosis of plasma cell myeloma, however, seems unlikely because of the duration of the course, the absence of bony lesions on x-ray studies, the atypical protein pattern shown by electrophoresis, and the lack of characteristic myeloma cells in the bone marrow.

CASE 3.—A 60-year-old housewife was in excellent health until February, 1950, when her left knee became acutely painful; shortly thereafter pain and swelling in the metatarsophalangeal joints appeared. There was morning stiffness, and the patient tired easily. Three months later excruciating, burning pain suddenly occurred in both hands, in the right hand more than the left, limited to the palmar surfaces of the first three digits and the radial aspect of the fourth digit. Subsequently the involved fingers became numb. The pain was characteristically worse at night. The first four fingers and the dorsa of both hands were swollen. There was a bulge on the volar side of the wrists. There was no limitation of motion of the small joints of the hands or wrists. Pressure on the volar surface of the wrists caused pain in the first three fingers. The abductor pollicis brevis and opponens pollicis were atrophied bilaterally. Pain and tactile sensations were diminished over the median nerve distribution in both hands.

Laboratory studies showed a normal blood cell count and erythrocyte sedimentation rates between 33 and 50 mm. in one hour (Westergren). There was no proteinuria. An agglutination test with the hemolytic Streptococcus (group A) was positive, and the differential sensitized sheep cell titer was +64, also positive. X-ray films of the wrists and fingers showed no pathological joint conditions, and, in films of the left knee, subchondral demineralization and irregularity of the medial condyle of the femur were noted.

Both carpal tunnels were explored and the findings were identical. The median nerves were flattened between the transverse carpal ligaments and large granulomatous-appearing tendon sheaths. These tendon sheaths were stripped away. The microscopic sections of the tendon sheaths (stained with hematoxylin and eosin) showed dense bands of collagenic tissue with an increased number of blood vessels, around which were collections of lymphocytes and neutrophils. There were scattered large mononuclear cells. Periodic acid Schiff,[3a] cresyl violet, and congo red stains for amyloid were not taken up. The tentative diagnosis was a nonspecific inflammatory lesion of the tendon sheaths.

This is a patient with rheumatoid arthritis, with corroborative positive serologic tests, whose course was complicated by a bilateral median neuritis. The inflammatory lesion of the flexor tendon sheaths in the carpal tunnel, which led to the compression of the median nerves, was a nonspecific one, as would be expected in rheumatoid arthritis.

COMMENT

As well as in the patient reported on in case 1, plasma cell myeloma with amyloid disease and median neuritis has been observed in three male patients on whom surgical exploration of the carpal tunnels was not done. The pertinent clinical findings for the four patients can be summarized briefly: Their illnesses began with a median neuritis that became bilateral in a short time. Diffuse swelling of the first three fingers and a variety of flexion contractures developed. Subcutaneous masses obviously attached to tendon sheaths were confused with the signs of rheumatoid arthritis. A heavy proteinuria was present; the conventional test for Bence-Jones protein was positive in two cases. There was no hyperglobulinemia; the highest figure was 2.2 gm. per 100 cc. (Howe). Myeloma cells were found in the bone marrow of all these patients, and biopsy specimens of tendon sheaths in three instances and tongue nodules in one showed amyloid.

These four cases, as well as the second of those reported, had been diagnosed initially as rheumatoid arthritis. As alternative diagnoses the shoulder-hand syndrome, Raynaud's disease, or multiple sclerosis had been considered. While the patient reported on in case 3 had rheumatoid arthritis and compression of the median nerves by nonspecific inflammatory tissue compatible with rheumatoid arthritis, we feel that this disorder as a cause of the carpal tunnel syndrome is a distinct rarity.

5. Jones, B.: Personal communication to the authors.

No similar case has been observed in the arthritis clinic of the Presbyterian Hospital in a series of over 1,000 consecutive cases with the diagnosis of rheumatoid arthritis.

Although there are obvious limitations of histochemical procedures for the recognition of amyloid, these procedures may be adequate for distinguishing between amyloid and dense collagenic connective tissue. The treatment of the carpal tunnel syndrome is primarily that of decompression. It seems advisable, however, on the basis of the findings in patients in this report, to perform a biopsy on the tissue responsible for the median nerve compression.

SUMMARY

Of three patients with the carpal tunnel syndrome associated with a systemic disease, one had multiple myeloma with amyloid disease, another had primary amyloid disease, and a third had rheumatoid arthritis. An additional three patients had amyloid associated with multiple myeloma and median neuritis. The carpal tunnel syndrome occurs in rheumatoid arthritis, but its incidence is of a low order. Special histological techniques for the demonstration of amyloid in specimens from the carpal tunnel syndrome are important.

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FUNCTIONAL AND NEEDLE BIOPSY STUDY OF THE LIVER IN MALARIA

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Although abnormal liver function tests in malaria have been reported by several investigators,[1] the significance of the tests has not been completely elucidated. An analysis of 37 cases of malaria is presented in an effort to ascertain whether the abnormal liver function tests demonstrate true liver damage or whether they merely represent a generalized reaction of the reticuloendothelial system to the malaria parasite. The importance of proving whether or not malaria produced a primary type of hepatocellular disease is of great consequence because if such were the case, these patients should be treated for hepatitis as well as malaria.

MATERIAL AND METHODS

Thirty-seven cases of naturally acquired acute and relapsing types of malaria are reported. There were 19 cases caused by Plasmodium falciparum, 14 cases caused by P. vivax, 2 cases caused by P. malariae, and 2 cases caused by unidentified protozoa. Liver function was studied by the use of the following tests: cephalin-cholesterol flocculation, thymol turbidity, gamma globulin (turbidity test as described by De La Huerga and Popper), zinc sulfate (turbidimetric estimation of serum gamma globulin as described by H. G. Kunkel), sulfobromophthalein (Bromsulphalein) excretion (using 5 mg./kg. of body weight as the standard dose and making a determination of the retained dye after 45 minutes), serum bilirubin, prothrombin time, total proteins and albumin-globulin ratio, serum cholesterol and cholesterol esters, and, in a few cases, needle biopsy of the liver with a Vim-Silverman needle. The results of the tests are given in tables 1, 2, and 3. Of the original nine determinations of abnormal amounts of cholesterol, the highest total amount was 120 mg. per 100 cc. and the lowest was 83 mg. per 100 cc. From one to seven days after treatment, six of these patients were again tested and the results of four of the tests were still abnormal. Between 8 and 14 days after treatment, all values but one were back to normal; the last one became normal on the 21st day after treatment. Four of the 10 patients had low ester fractions before treatment that became normal with two weeks.

LIVER BIOPSY

Biopsy with the Vim-Silverman needle was carried out on seven patients. The pathologist reported that the specimens measured 1 by 5 mm. The tissues were fixed with formaldehyde solution (Formalin) sectioned 5 μ thick, and studied with Giemsa and hematoxylin-eosin stain. The sinusoids were not congested. No parasites were seen in the erythrocytes within the vessels or in other sections of the biopsy material. Most of the segmented leukocytes present were eosinophils. The Kupffer cells contained several dark brown, refractile, small granules of pigment. There was neither an increase in the number or the size of the Kupffer cells. Hepatic cells were polygonal and of equal size, and they formed regular cords. The cytoplasm was finely granular and contained a normal amount of glycogen. No cloudy swelling, fatty change, or hyaline necrosis was seen. The portal areas showed no increase in leukocytes, fibrosis, or hyperplasia of duct epithelium.

The histological appearance of the liver biopsy specimens was considered normal. There was neither a pathognomonic indication of malaria nor any correlation with the abnormal liver function tests. The only unusual findings were the presence of eosinophils not indicated in the peripheral blood cell count and the presence of granular pigment in the Kupffer cells, which is considered consist-

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Dr. Frederic D. Regan and Dr. George Cameron assisted in the preparation of this paper.

1. (*a*) Kopp, I., and Solomon, H. C.: Liver Function in Therapeutic Malaria, Am. J. M. Sc. **205**: 90-97 (Jan.) 1943. (*b*) Fredericks, M. G., and Hoffbauer, F. M.: Study of Hepatic Function in Therapeutic Malaria, J. A. M. A. **128**: 495-498 (June 16) 1945. (*c*) Mirsky, I. A.; von Brecht, R., and Williams, L. D.: Hepatic Dysfunction in Malaria, Science **99**: 20-21 (Jan. 7) 1944. (*d*) Cook, C. D., and Hoffbauer, F. W.: Liver Functional Impairment in Therapeutic Malaria with Particular Reference to Unsuccessful Use of Methionine as Protective Agent, J. Lab. & Clin. Med. **31**: 56-64 (Jan.) 1946. (*e*) Machella, T. E.: Relationship of Bromsulphalein Retention to the Fever of Natural P. Falciparum Malaria, Am. J. M. Sc. **213**: 81-86 (Jan.) 1946. (*f*) Keys, A., and others: Experimental Malaria in Man: II. Liver Function, J. Clin. Invest. **29**: 60-68 (Jan.) 1950. (*g*) Lippincott, S. W., and others: Liver Function Tests in Chronic Relapsing Vivax Malaria, ibid. **240** 616-622 (Sept.) 1945. (*h*) Lippincott, S. W., and others: Liver Function Tests in Neurosyphilitic Patients with Induced Vivax Malaria of Pacific and Mediterranean Origin, J. Lab. & Clin. Med. **31**: 991-998 (Sept.) 1946.

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ent with malaria as described by W. A. D. Anderson.[2] The results of tests on the seven patients on whom biopsies were done are given in table 4.

COMMENT

Of the 33 patients on whom cephalin-cholesterol flocculation determinations were done, 17 had positive tests prior to treatment. Of those that were subsequently tested, all but one were normal two to four weeks after treatment. In contrast, it is noted that the results of the other turbidity tests were somewhat slower to become normal. Six thymol turbidity tests, three gamma globulin determinations, and five zinc sulfate determinations still gave abnormal results during the two to four week follow-up period. The liver profiles in the cases presented are very similar to those that one might expect in primary hepatocellular disease. Our findings differ from the results of Keys [1f] in regard to the thymol turbidity test. However, this difference might be explained by the fact that many of our patients had been having periodic paroxysms of fever and chills for many days or several weeks aboard ship without the benefit of the adequate diet and good nursing care that the patients in Keys' group had. To our knowledge no one has reported findings of the other turbidity tests in malaria at the time of this writing, so we are unable to compare our results with those of other studies.

In the group of patients on whom we did prothrombin determinations, most of the low readings were between 63 and 70% of normal and, as shown in table 1, all of the prothrombin time determinations were normal by the end of two weeks. In the same category of liver function, synthesis of protein, it is noted that although a few of the patients had low serum protein levels prior to therapy, all those patients tested had normal levels at the end of one week after treatment.

In the group of patients in whom sulfobromophthalein retention determinations were carried out, none of the patients were febrile at the time of the test. The one patient with a positive test had 20% retention four days after treatment. His test was repeated 20 days later, and no retention of the dye was found after 45 minutes. In the group of serum bilirubin determinations, only eight patients had abnormal values. All the results were normal by the end of the first week after treatment. These findings suggest that there is little or no excretory impairment of the liver as a result of malaria. The elevation of the serum bilirubin level in malaria is considered by most observers to be caused by an overload of blood pigment due to hemolysis rather than an excretory dysfunction of the liver per se. Low total cholesterols and low percentage of esterification in malaria has been previously reported by Kopp.[1a] Stoesser [3] reported that fever per se in the absence of acute infection does not alter blood lipids. However, it has been shown that pneumonia and other infections tend to lower blood lipids initially with

TABLE 1.—*Results of Liver Function Tests in Thirty-Seven Patients with Malaria*

	0-2 Units	3-4 Units
Cephalin-Cholesterol Flocculation (Normal Value 0 to 2 Units)		
Prior to treatment	16	17
1- 7 days after treatment	6	6
8-14 days after treatment	3	6
15-30 days after treatment	9	1
	To 5 Units	**Over 5 Units**
Thymol Turbidity (Normal Value up to 5 Units)		
Prior to treatment	10	22
1- 7 days after treatment	3	10
8-14 days after treatment	..	14
15-30 days after treatment	3	6
	To 10 Units	**Over 10 Units**
Gamma Globulin (Normal Value up to 10 Units)		
Prior to treatment	15	5
1- 7 days after treatment	4	3
8-14 days after treatment	3	4
15-30 days after treatment	2	3
	To 8 Units	**Over 8 Units**
Zinc Sulfate (Normal Value to 8 Units)		
Prior to treatment	10	12
1- 7 days after treatment	2	5
8-14 days after treatment	3	7
15-30 days after treatment	1	5
	75% or Over	**Less than 75%**
Prothrombin Time (Normal Value 75% or Over)		
Prior to treatment	8	3
1- 7 days after treatment	5	3
8-14 days after treatment	5	3
15-30 days after treatment	2	..
	Normal	**Over 7%**
Sulfobromophthalein (Bromsulphalein) (Normal Value up to 7% Retention)		
Prior to treatment	13	..
1- 7 days after treatment	3	1
8-14 days after treatment	5	..
15-30 days after treatment	6	..
	Normal	**Over 1 Mg. per 100 Cc.**
Serum Bilirubin (Normal Value to 1 Mg. per 100 Cc.)		
Prior to treatment	18	8
1- 7 days after treatment	7	2
8-14 days after treatment	6	..
15-30 days after treatment	7	..

TABLE 2.—*Serum Protein Values in Thirty-Seven Patients with Malaria*

	Normal Albumin (3.6-5.6 Gm. per 100 Cc.)	Normal Globulin (1.3-3.2 Gm. per 100 Cc.)	Low Albumin	Low Globulin	Albumin-Globulin Ratio: Normal	Albumin-Globulin Ratio: Abnormal
Prior to treatment	5	6	3	1	8	..
1- 7 days after treatment	1	2	1	..	2	..
8-14 days after treatment	1	1	..	..	1	..
15-30 days after treatment	1	1	..	..	1	..

TABLE 3.—*Cholesterol and Esters in Blood Serum of Thirty-Seven Patients with Malaria*

	Cholesterol 150-250 Mg. per 100 Cc.	Cholesterol Under 150 Mg. per 100 Cc.	Esters Under 60% of Total Cholesterol
Prior to treatment	1	9	4
1- 7 days after treatment	2	4	2
8-14 days after treatment	5	1	..
15-30 days after treatment	1	..	..

2. Pathology, Anderson, W. A. D., editor, St. Louis, C. V. Mosby Company, 1948.

3. Stoesser, A. V., and McQuarrie, I.: Influence of Acute Infection and Artificial Fever on the Plasma Lipids, Am. J. Dis. Child. 49: 658-671 (March) 1935.

periods of hypercholesteremia during convalescence and then eventually return to normal once the infection has subsided.[4] The patients with low cholesterol determinations noted in our group all had normal determinations within two weeks after treatment.

The microscopic sections failed to show hepatocellular damage in the patients with abnormal liver function tests on whom liver biopsies were done. Although fairly good correlation between liver function tests and biopsy material has been demonstrated, Moyer and others [5] reported cases with normal liver biopsy specimens and abnormal thymol turbidity tests. White and others [6] found variable correlation of function studies and biopsy material, especially in subclinical liver disease.

TABLE 4.—*Liver Profile of Patients on Whom Biopsy Was Done*

Case No.	Type of Malaria	Day After Treatment Biopsy Was Done	Cephalin-Cholesterol Flocculation, Units			Thymol Turbidity, Units/100 Cc.			Gamma Globulin, Units			Zinc Sulfate, Units			Prothrombin Time, % of Normal			BSP§ Retention (45 Min.), % Prior to Treatment	Serum Bilirubin, Mg./100 Cc.			Cholesterol, Mg./100 Cc.			Cholesterol Esters, %		
			A*	B†	C‡	A	B	C	A	B	C	A	B	C	A	B	C		A	B	C	A	B	C	A	B	C
1	P. falciparum	2	0	0	..	4.5	5.5	...	4.5	4.8	...	6	5.2	...	70	65	..	5	4	1.7	...	..	120	..	..	89	..
2	P. vivax	6	..	0	..	...	9.5	...	...	9.5	...	...	6.5	...	..	..	..	..	...	0	...	..	102	..	..	65	..
3	P. vivax	7	4	..	3	11.8	...	8.3	8.8	...	10.3	9.6	...	12.5	75	..	63	5	0.7	...	0	..	..	..	..	..	..
4	P. vivax	3	4	..	..	19	...	...	9.5	...	...	17.4	...	...	..	..	..	0	0	0	...	85	..	..	20	..	
5	P. vivax	5	3	..	..	13	...	...	11	...	...	15	...	...	100	..	100	0	1.4	...	...	108	..	..	..	51	..
6	P. falciparum	6	3	..	0	18	...	13	10	...	10	15	...	11	75	..	..	..	...	...	0	..	..	234	..	..	131
7	P. falciparum	5	4	4	..	13.8	9.7	...	7.5	9.6	...	10.7	14.3	...	75	..	..	5	1	1	...	..	..	..	..	..	..

* A = test made prior to treatment.
† B = test made 1 to 7 days after treatment.
‡ C = test made 7 to 14 days after treatment.
§ Sulfobromophthalein (Bromsulphalein).

SUMMARY AND CONCLUSIONS

We were unable to demonstrate that malaria produces primary hepatocellular disease. In the patients on whom we obtained liver biopsy specimens, no destruction of hepatic tissue could be demonstrated. It was also noted that although most of our patients had liver function tests with results similar to those one might expect to see in acute infectious hepatitis, these tests in most instances gave normal results after the patient had had antimalarial therapy. The abnormalities noted in biochemical tests used to show liver disease carried out in this study are probably the result of a diffuse involvement of the reticuloendothelial system, which is produced by the malaria parasite. There is no evidence, from our study, to point toward chronic hepatitis as a sequel to malaria. The treatment for malaria should be mainly directed at the disease per se; the hepatocellular abnormalities noted in our study became normal shortly after specific therapy for malaria was initiated.

4. Stoesser and McQuarrie.[2] Kipp, H. A.: Variation on the Cholesterol Content of the Serum in Pneumonia, J. Biol. Chem. **44**: 215-237 (April) 1920. Stoesser, A. V.: Altered Lipid Metabolism in Acute Infections of Infants and Older Children, Am. J. Dis. Child. **56**: 1215-1230 (Dec.) 1938.

5. Moyer, J. H., and Wurl, O. A.: Liver Biopsy: Correlation with Clinical and Biochemical Observations, Am. J. M. Sc. **221**: 28-37 (Jan.) 1951.

6. White, T. J., and others: Needle Biopsy of the Liver: A Critical Evaluation, J. M. Soc. New Jersey **46**: 549-555 (Dec.) 1949.

BEDSIDE DETERMINATION OF TOTAL BASE IN SERUM

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In 1923, Gamble [1] showed that the serum total base concentration reflected the total electrolyte concentration throughout the body and constructed his now famous Gamblegram to illustrate the importance of total base. However, total base was a difficult determination in the clinical laboratory. With the advent of the flame photometer, the serum sodium determination came to be used as a substitute for the determination of total base. This has not, however, been completely satisfactory. A flame photometer is not available in many laboratories. Furthermore, the technique is an expensive, exacting, time-consuming one for the average clinical laboratory and it is difficult to set up the photometer for a single weekend or night emergency determination. There is a need for a simpler, more widely available test. The principle of utilizing a column of cation exchange resin to determine total base is the basis for the methods of Polis and Reinhold [2] and others.[3] All of these techniques are complex, however, and are not suitable for bedside work.

At first the bedside test for total base was suggested by one of us (H. T. W.),[4] who devised a method in which resin and sample were mixed by shaking them together in

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The methods presented in this paper will be demonstrated as a scientific exhibit at the 103rd Annual Meeting of the American Medical Association in San Francisco, June 21-25, 1954.

Dr. Joseph McCarthy, Professor of Chemical Engineering, and Dr. Allen M. Scher of the Department of Physiology and Biophysics, aided in this Projcet. Miss Janet Johnson and Miss Elma Lile gave technical assistance.

1. Gamble, J. L.; Ross, G. S., and Tisdall, F. F.: The Metabolism of Fixed Base During Fasting, J. Biol. Chem. **57**: 633 (Oct.) 1923.

2. Polis, B. D., and Reinhold, J. G.: The Determination of Total Base of Serum by Ion Exchange Reactions of Synthetic Resins, J. Biol. Chem. **156**: 231 (Nov.) 1944.

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a small test tube.[4] The supernatant was then drawn off and titrated with standard base. Although this method was satisfactory, it was suggested that running the serum through a column of cation exchange resin might be more accurate. A suitable resin column was devised, and this led to the development of the present method, which is nothing more than a simplification of the technique of Polis and Reinhold.[2] This method has proved simple, rapid, and accurate. The test may be made at the bedside and, since we have found it as accurate as the flame photometer test, it may also be useful in the clinical laboratory.

PRINCIPLE OF THE METHOD

The characteristics of synthetic exchange resins have been described[5] and will not be discussed in detail. Serum is put through a column containing a cation exchange resin that almost completely removes Na^+, K^+, Ca^{++}, and Mg^{++} and releases a chemically equivalent amount of H^+. Part of the H^+ reacts with the bicarbonate in the serum to form carbonic acid, which is allowed to escape. This fraction of H^+ ion equals the serum bicarbonate level, which is determined on a separate sample using another bedside test (see this issue, page 644). The remainder of the H^+ released by the column is determined by titrating the serum back to pH 7.40 with standard sodium hydroxide. Hence, the amount of base used in this titration plus the serum bicarbonate reflects the total amount of H^+ ion released, which equals the concentration of total base in the serum. Tuberculin syringes are used to measure volumes. Sample size, reagent strengths, and standardization procedure are so arranged that results are read directly from the scale of the tuberculin syringe.

REAGENTS[7]

The reagents marked with an asterisk are also used in the bedside test for bicarbonate. Consult the description of this method or a standard laboratory manual for detailed instructions concerning their preparation.

* *Standard total base reagent.*—100 mEq. (5.85 gm.) sodium chloride and 25 mEq. (1.32 gm.) sodium carbonate per liter.

* *Standard 0.1 N Sodium Hydroxide in 3.6% Sodium Nitrate.*—Prepare a saturated solution (about 110 gm. in 100 cc.) of sodium hydroxide and allow it to stand for two to three days until the carbonate precipitates. Dilute 7 to 8 cc. to a liter using distilled water that has been boiled to remove carbon dioxide and which contains 3.6% sodium nitrate. (If time is limited 5 gm. of pellets from a freshly opened bottle of reagent grade sodium hydroxide may be used; however, carbonate contamination will be greater.) Standardize the base against standard 0.1 N acid. The standard base should be stored in a tightly capped container (preferably polythene), and exposure to carbon dioxide should be avoided. The supply of sodium hydroxide in the 2 oz. bottle in the test set (see below) must be discarded when the bottle becomes one-half to two-thirds empty. Rinse the bottle twice with fresh base and refill. This prevents accumulation of carbonate precipitate in the bottom. (Note: The sodium nitrate is added to this reagent to prevent precipitation of protein during the titration.)

* *0.040% phenol red indicator.*

Cation exchange resin.—Pass standard 20-50 (Tyler) mesh Dowex 50 or Amberlite 120 resin cross linked with 8 or 9% divinyl benzene through a no. 35 (Tyler) mesh screen. The resin that does pass the screen should be conditioned in a column with not less than 20 times its volume of 4% sulfuric acid. The acid should pass slowly and steadily through the column in not less than 24 hours. The column may be made out of a glass tube one to two feet long with a one hole stopper covered by glass wool in the bottom. The outlet should be connected to a rubber tube, the end of which is raised above the level of the resin. This prevents the resin column from drying out, which must not occur. After conditioning, the resin should be placed in a beaker and rinsed with distilled water by decantation until rinsings are the same pH as is the rinse water. Test the resin with pH paper. Screened and conditioned resin will keep indefinitely if not allowed to dry out.

SUPPLIES AND EQUIPMENT

The items marked with an asterisk are also required for the bicarbonate test set (see this issue, page 645) if a combination total base-bicarbonate test set is built.

One or more syringe barrels for resin column.—Block the bottoms of the barrels from discarded 1 cc. tuberculin syringes with circles of fine mesh screen (fig. 1*A*). These can be cut with ordinary scissors from 70 or 80 mesh Monel metal screen. Glass wool does not make a satisfactory screen for this purpose. Push the screen to the bottom of the barrel to prevent the resin from falling out. The screen should fit tightly so that it cannot be washed out.

Cut a slice about 0.25 in. thick from a no. 9 rubber stopper and drill a hole in its center large enough to admit the syringe barrel. The rubber serves to support the column over the titrating test tube. Cut a V notch about two-thirds of the way through one side of the rubber slice to let the air escape from the titrating test tube.

* *0.5 cc. sample syringe.*—Fit a 1 cc. tuberculin syringe into a syringe stop attachment (fig. 1*B*). A 1.5 in. no. 20 hypodermic needle should be added to the tip of the syringe. This may be slipped on in the usual way. However, it is recommended that the shaft be cemented into the tip as follows. Cut the hub from the shaft. Square its ends and make sure the lumen is patent. Seal the shaft into the tip of the sample syringe with

3. (*a*) Nordmann, J.; Nordmann, R., and Gauchery, O.: Determination de l'électrolytemie à l'aide des résines d'échange ionique, (Determination of Blood Electrolytes with the Help of Ion Exchange Resins), Ann. biol. clin. **11**: 30 (Jan.-Feb.) 1953. (*b*) Vanatta, J. C., and Cushing, I.: Use of an Ion Exchange Resin to Determine Total Base in Serum, Fed. Proc. **12**: 146 (March) 1953. (*c*) Süllman, H.: Bestimmung der Gesamtbasen durch Anionenaustausch, (Determination of Total Base by Anion Exchange Resin IRA-400), Klin. Wchnschr. **30**: 185 (Feb.) 1952. (*d*) Bonting, S. L.: Improved Total Base Determination in Serum, Urine and Tissue Ash by Ion Exchange, J. Lab. & Clin. Med. **41**: 968 (June) 1953.

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5. Goodale, R. P.: Ion Exchange Issue, Resinous Reporter **9**: 3 (July) 1948. Kunin, R.: Ion Exchange, J. Anal. Chem. **21**: 87 (Jan.) 1949. Myers, R. J.; Eastes, J. W., and Myers, F. J.: Synthetic Resins as Exchange Absorbents, Indust. and Engin. Chem. **33**: 697 (June) 1941.

6. Footnote deleted on proof.

7. All reagents including screened and conditioned resin and all supplies including syringe stops, color standards, and tuberculin syringe barrels for columns as well as a complete test set may be obtained from Rochester Products Company, Rochester, Minn.

DeKhotinsky or other strong, waterproof cement. The needle shaft must not project into the chamber of the syringe. Remove the plastic cap from a 2 oz. dropper bottle such as that used by a pharmacy to dispense nose drops. Remove the glass dropper from the cap and cut the top off the bulb. Then fit the cap on the lower end of the sample syringe. The revised dropper bulb becomes a bushing that holds the syringe in the plastic cap. Fill the 2 oz. dropper bottle with distilled water.

* *A 1 cc. tuberculin syringe for sodium hydroxide titration.*—The tip of this syringe should be modified as follows (fig. 1*C*). Heat the tip of the dry syringe in a Bunsen burner flame, being careful to rotate the tip. When the glass softens the orifice will slowly close. Allow this to proceed until the shrunken orifice will just admit the wire, which fits in a no. 23 to no. 24 gauge needle (approximately a no. 38 gauge wire). The titrating syringe should also be fitted with the little metal clip that steadies the plunger. (These suggestions about the base titrating syringe can also be applied to the mercury syringe of the chloride test set previously described.[8]) This syringe may also be fitted into the cap of a 2 oz. dropper bottle. Fill the bottle with standard base.

* *Three or more titrating test tubes.*—These should be about 1 in. outside diameter and 4 in. long. A pyrex rimless culture tube no. 9820 is suitable.

* *Color standard.*—Heat the neck of a titrating test tube and pull it out to form a narrow constriction that can be sealed later to form an ampul. Place 2.5 cc. of pH 7.4 buffer, made from *p*-Hydrone or other buffer capsules, in the ampul and add 0.25 ml. of 0.04% phenol red indicator. Seal the ampul and place in boiling water for 30 min. This sealed color standard will keep for an indefinite period but should be checked about once a year by comparing it to a fresh standard made up in a regular titrating test tube.

A 2 oz. dropper bottle for distilled water.—The dropper of this bottle is used to rinse the resin column (fig. 1*A*). Hence its tip should be modified to fit down into the top of the barrel: heat the tip of the dropper in a flame and pull it out until its outside diameter is 2 or 3 mm. Keep its inside diameter as large as possible. The overall length should permit the dropper to nearly reach the bottom of its bottle.

A 2 oz. dropper bottle for resin.—The dropper of this bottle should be modified in the same way as the dropper in the distilled water bottle.

* *A small bottle to contain standard total base reagent.*

* *A 2 oz. dropper bottle for phenol red indicator.*

* *Short, large diameter test tubes or other containers.*—These serve as holders for the titrating test tubes. All the bottles and test tube holders can be mounted in a box or taped together to form a test set.

PROCEDURE

1. Make the column of resin (fig. 1*A*): Rinse the empty barrel once with distilled water from the supply in the test set. Holding a finger over the tip, fill the barrel with distilled water. Take a dropperful of resin and, after placing the tip of the dropper into the water in the top of barrel, allow the particles of resin to drop down the barrel. Fill the barrel with resin to between the 0.5 and 0.6 cc. marks, tapping lightly to level and pack the resin. Avoid trapping air bubbles in the column. Remove your finger and the water will drain down to the level of the resin and stop. The column is now ready to use. It will keep for an indefinite period provided the resin does not dry out. Resin can be used for only one determination. When the same barrel is used for several determinations during the day, rinse out the used resin by running tap water backward through the syringe barrel before each new test. Occasionally, the barrel should be washed in detergent. A good time to do this is at the end of a day's work so that the protein does not dry on the barrel. After washing, leave the barrel empty until needed.

2. If the sides of the barrel above the resin are dry, moisten them with a little distilled water and allow it to drain out. Then place the column of resin in the titrating test tube with the rubber support resting on the rim (fig. 1*A*).

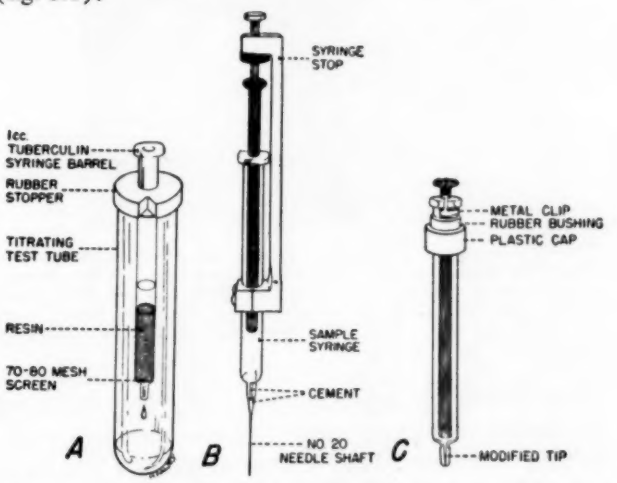

Fig. 1.—*A*, cation exchange column; *B*, sample syringe (The cap from the 2 oz. bottle that should be located below the syringe stop has been omitted); *C*, titrating syringe.

3. Draw about 0.1 cc. of serum to be tested into the sample syringe, which has been properly standardized (see below). With the syringe pointing upward, pull the plunger all the way out and then expel the serum. This rinses the syringe with sample and eliminates bubbles. Fill the syringe and introduce the sample into the resin column. Place the tip of the needle down near the level of the resin to avoid getting sample high on the sides of the barrel. Allow the resin column to drain until it stops dripping.

4. Using the specially shaped dropper, rinse the resin column with one dropperful (about 0.75 cc.) of distilled water. Allow it to drain completely.

5. Rinse resin column once more using one dropperful of distilled water.

6. Add six drops of indicator to the sample and swirl the titrating test tube for not less than two minutes to remove carbonic acid. Try to swirl the sample up on the

8. Scribner, B. H.: Bedside Determination of Chloride: Method for Plasma, Urine and Other Fluids and Its Application to Fluid Balance Problems, Proc. Staff Meet., Mayo Clin. **25**: 209 (April 26) 1950.

sides. Avoid making bubbles. Swirling for 30 seconds is satisfactory if speed is essential. The precision of the test, however, is decreased to ± 2 mEq. instead of ± 0.50 mEq.

7. Fill the special titrating syringe to the zero line. (This is actually the 1 cc. line on the syringe because the scale on a tuberculin syringe is backwards for titrating.) Avoiding parallax, carefully adjust the plunger to

Fig. 2.—The correct position for titrating. Note that the syringe and test tube are held in the same hand and can be shaken as a unit to wash a fraction of a drop off the syringe tip. Note also the index finger steadying the plunger, which is moved with the other hand. (From Scribner, B. H.: Proc. Staff Meet., Mayo Clin. **25**: 209-218 [April 26] 1950.)

the bottom of the zero line. This facilitates estimating the titration volume accurately to the nearest one-quarter division as follows: Let the bottom of each line equal unity. Halfway to the top of the next line equals one-quarter division; the top of the next line equals one-half division; the middle of that line equals three-quarters division. (Estimating to the nearest one-half division (1 mEq./liter) gives sufficient accuracy for most clinical applications.)

8. Place the syringe in the titrating test tube so that the tip can be continually washed by the sample (fig. 2).

9. Add the sodium hydroxide slowly with constant swirling. Better control of the volume is obtained if the syringe plunger is rotated as it is advanced. As the end point is approached, the base must be added more slowly so that momentary persistence of red color is avoided. Even though the color will fade again, do not go beyond the end point. If the titration is carried out properly with sufficient agitation, the end point will be gradually approached and almost no fading will occur.

The end point is determined by comparing the sample color with that of the color standard. The shade rather than the depth of color is noted. This can be seen only by tilting the tube and color standard above but not against a white surface and looking for the magenta hue or purplish cast in the thin layer of liquid (fig. 3). An easy way to titrate and at the same time see the magenta hue is to place a white towel in the lap and hold the sample and color standard over it, steadying elbows against the sides of the abdomen. The magenta or purplish hue is seen best in daylight or bluish artificial light. This hue comes up suddenly with the addition of not more than 0.0025 cc. (one-quarter division) of base.

To be sure the end point has been reached, note the reading on the syringe and then add one-quarter division more base. This should make the sample definitely more magenta than the color standard. If it does not, continue the titration. The beginner will tend to undertitrate.

10. Read off the scale of the tuberculin syringe the amount of base used in the titration. The actual numbers on the scale should be ignored since they are reversed. The amount of base used expressed in 0.01 cc. times 2, plus the serum bicarbonate in milliequivalents, equals the total base. For example, suppose the titration was 60.25 divisions (0.01 cc.) and the serum bicarbonate by the bedside method (or the usual CO_2 combining power) was 30 mEq./liter. The total base would then be $60.25 \times 2 = 120.5$. $120.5 + 30 = 150.5$ mEq./liter.

STANDARDIZATION

The test kit is standardized by performing a regular determination on the standard total base solution. If the titration value obtained is 0.50 cc. ($50 \times 2 + 25 = 125$ mEq./liter), the set is standardized. If not, the volume of the sample is altered by changing the position of the screw on the syringe stop until a titration of 0.50 cc. is obtained on the standard.

Once standardized, the set should remain so until new sodium hydroxide is required. It is probably wise to

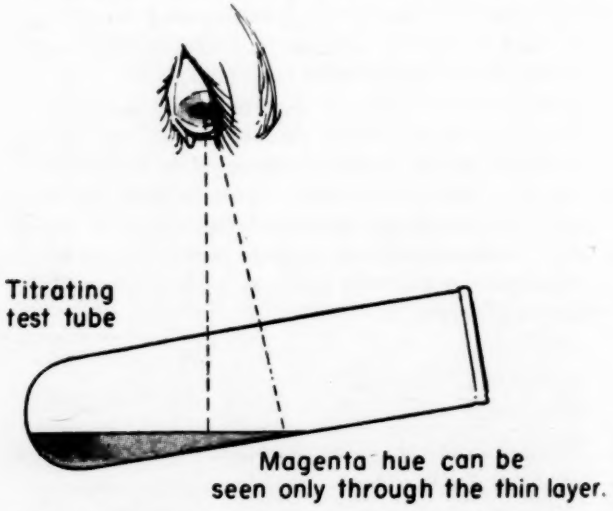

Fig. 3.—Titrating test tube (and color standard) must be tilted nearly horizontal in order to see purplish hue through the thin layer.

check standardization once a day, or whenever the set is used, if it is used infrequently. It is a simple matter to run the standard right along with the unknown. If an incorrect result should be obtained on the standard, the result on the unknown can be adjusted accordingly. The end point with the standard will fade slightly because the solution is unbuffered. The titration should be continued until no fading occurs after 30 seconds.

SOURCES OF ERROR

1. *Improper rinsing of column.*—If mixing occurs when rinse water is added to the column, two rinses may not be sufficient to get all the sample out. To determine whether or not the rinsing technique is satisfactory, proceed as follows: Put about 2 cc. of distilled water and five drops of indicator in a titrating test tube and shake 30 seconds. Add base carefully until the solution matches the color standard and does not fade. Wash the column in question once into this tube (fig. 1*A*). The color of the solution will fade slightly due to the slight acidity of distilled water and the trace of acid remaining in the column. If the solution fades to pale red or amber, rinsing is satisfactory. If it turns yellow, rinsing is incomplete. The yellow rinse solution should be titrated back to the end point and the amount of base used added to that used in the original titration.

2. *Severe jaundice or hemolysis.*—When the serum bilirubin is 5 mg. per 100 cc. or above, a premature end point causes results to be 1 to 5 mEq./liter too high. This error can be minimized by adding an additional 3 dropperfuls of water and 5 drops of indicator before agitating the sample.

3. *Carbonate contamination of sodium hydroxide.*—Although the sodium hydroxide need not be carbonate-free, large contaminations will give high results. Therefore it is important to keep the sodium hydroxide as free of carbonate contamination as possible by carefully observing the precautions mentioned in the section on reagents.

4. *Alterations in blood pH.*—A potential source of error is a deviation of the pH of venous blood of the patient from normal levels of about 7.4. Van Slyke [9] and Nadeau [10] advocate eliminating this error by making the color standard out of an anaerobically obtained sample of the patient's serum. We believe such a complicated elaboration of the technique is unnecessary. In the rare instance in which a marked alteration in blood pH is suspected, the pH can be determined directly and the total base result corrected as follows: For every 0.1 pH the venous blood is below 7.4 (38 C) subtract 1 mEq./liter from the result obtained for total base. A similar correction factor should be added when the blood pH is elevated. That this correction is really unnecessary is indicated by the following extreme example. A patient had a serum bicarbonate of 4.5 mEq./liter and a blood pH of 7.08. The total base was calculated from the sum of Na^+, K^+, Mg^{++}, and Ca^{++} to be 142.8 mEq./liter and determined by the bedside method to be 143.8 mEq./liter uncorrected. The result corrected for pH would be 140.8 mEq./liter.

5. If poor duplicate checks are obtained while standardizing the test, check with test paper the acidity of the water in the resin bottle. If the pH is below 5.0, rinse the resin with distilled water.

ACCURACY OF METHOD

The period of agitation of the sample affects the precision of the method. With a 30 second shake, duplicate samples may differ from each other by as much as 2 or 3 mEq./liter. With a two minute shake, duplicate samples should seldom differ by more than 1 mEq./liter, and in our experience 90% differ by 0.5 mEq./liter or less. In order to check the accuracy of the method, serums from 26 patients with widely varying electrolyte and serum protein disturbances were studied. Total base was determined by the column method and also calculated from the sum of the cations Na^+,[11] K^+,[11] Mg^{++},[12] Ca^{++} [13] individually determined. These results are summarized in the table. The standard deviation was 1.3 mEq./liter.

INTEGRATION WITH OTHER BEDSIDE TESTS

Because the serum bicarbonate (or carbon dioxide combining power) must be known in order to calculate the total base, and because so many reagents are common to both tests, a combined total base-bicarbonate test set is desirable. The two tests may be combined in either of two ways. 1. The 1 cc. sample for the bicarbonate test can be measured by filling the total base sample syringe twice. The bicarbonate sample is titrated with the same base and syringe used in the total base procedure. 2. The bicarbonate sample size is reduced to about 0.5 cc. and is measured with the total base sample syringe. A separate titrating syringe and 0.05 N base are used to titrate the bicarbonate sample. If the first combination is chosen, the combined set would include color standard; a 2 oz. bottle of 0.1 N sodium hydroxide in 3.6% sodium nitrate with special titrating syringe; a sample syringe with syringe stop for 0.5 cc. sample (stored in a 2 oz. dropper bottle); a 2 oz. bottle of standard acid with tuberculin

Comparison of Two Methods of Determining Total Base in Serum

	Sum of Na^+, K^+, Ca^{++}, Mg^{++}, mEq./Liter	Bedside Total Base Determination, mEq./Liter
1	153.1	154.5
2	134.5	135.0
3	153.1	152.5
4	165.6	163.5
5	153.4	153.8
6	156.4	154.5
7	157.4	154.3
8	148.3	149.5
9	152.2	151.5
10	154.6	153.8
11	156.7	154.5
12	154.1	153.5
13	157.0	156.3
14	156.9	157.5
15	154.4	154.3
16	149.3	148.5
17	153.7	154.8
18	139.3	141.5
19	154.3	153.5
20	142.8	143.8
21	156.8	156.5
22	154.2	152.8
23	131.1	130.5
24	186.9	185.5
25	156.2	156.9
26	150.7	151.5
Mean	153.1	152.8

Standard deviation = 1.3 mEq./liter.

9. Van Slyke, D. D.: Determination of the Bicarbonate of Blood and Plasma, abstracted, J. Biol. Chem. **50**: 16 (Feb.) 1922.
10. Nadeau, G.: Simple Method for Combined Determination of Plasma Bicarbonate, pH and Chloride, Am. J. Clin. Path. **23**: 710 (July) 1953.
11. White, J. U.: Precision of a Simple Flame Photometer, J. Anal. Chem. **24**: 1394 (Feb.) 1952.
12. Clark, E. P., and Collip, J. B.: Tisdall Method for Determination of Blood Serum Calcium with a Suggested Modification, J. Biol. Chem. **63**: 461 (March) 1925.
13. Heagy, F. C.: The Use of Polyvinyl Alcohol in the Colorimetric Determination of Magnesium in Plasma or Serum by Means of Titan Yellow, Canad. J. Res., sect. B **26**: 295 (Dec.) 1948.

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syringe and syringe stop set at 0.7 cc.; a 2 oz. bottle of phenol red indicator with dropper; a 2 oz. bottle of standard total base—carbonate reagent; a 2 oz. bottle of distilled water with special dropper for rinsing column; a 2 oz. bottle of resin with special dropper; one or more cation exchange columns; two or more titrating test tubes; holders for color standard and titrating test tubes.

If the second plan is chosen, the combined set will contain, in addition to the above, another 2 oz. bottle containing 0.05 N sodium hydroxide and another special titrating syringe. In either of the combined sets the same sample syringe is used for both tests. The total base must be standardized first by adjusting the volume of the sample syringe. The bicarbonate test is standardized by varying the volume of acid added.[6]

A combination total base-bicarbonate-chloride test kit can be assembled by combining a total base kit with the chloride-bicarbonate kit that is described elsewhere (see this issue, page 645). Such a kit would have several common reagents including standard acid and base, phenol red indicator, and total base-bicarbonate-chloride standard. It would have two sample syringes, one for total base and one for chloride and bicarbonate.

With such a kit it would be possible to arrange sample volumes so that total base, bicarbonate, and chloride tests could be performed on 0.75 cc. of serum, 0.25 cc. for total base (see below) and 0.5 cc. for the combined bicarbonate-chloride test. By decreasing the sample size precision is sacrificed to a certain extent, but the methods are still sufficiently accurate for most clinical needs. It should be noted, however, that as the strength of the sodium hydroxide is decreased to accommodate smaller sample volumes, the errors due to carbonate contamination increase in proportion. Therefore, extreme care must be taken to protect dilute sodium hydroxide solutions from becoming contaminated with carbonate (see section on reagents).

SUGGESTED APPLICATIONS

Although this method is called a bedside method, it is accurate enough to be used in the clinical laboratory and even in clinical investigation. For laboratories and hospitals that do not have a flame photometer, the bedside total base method offers a satisfactory substitute for the serum sodium determination. Even for laboratories that do have a flame photometer, this method offers the advantages of speed, simplicity, and reliability. The greatest disadvantage to the routine clinical determination of total base is that the clinician is used to thinking in terms of the serum sodium. This problem can usually be overcome by pointing out that serum sodium can be predicted from the total base by subtracting 11 mEq./liter. On 26 specimens the standard deviation of the error of this prediction was 1.2 mEq./liter.

It may be desirable, particularly when the test is performed on infants, to set up the method on a 0.25 cc. serum sample instead of the 0.5 cc. sample. The easiest way to accomplish this is to make the base 0.05 N in 3.6% sodium nitrate instead of 0.1 N. If this is done, the methods, including the standardization procedure and calculations, are as given above. Halving the sample size decreases the accuracy somewhat. However, the test is still precise enough for routine clinical usage.

SUMMARY

The technique for the bedside determination of total base on 0.5 or 0.25 cc. of serum described employs a column of cation exchange resin built in the barrel of a tuberculin syringe. The test takes five minutes or less and is simple and reliable. The precision is ± 0.5 mEq./liter. The results by this method were compared with those obtained by totaling the sum of the cations determined individually. The standard deviation of the mean was 1.3 mEq./liter.

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IMPROVED METHOD FOR THE BEDSIDE DETERMINATION OF BICARBONATE IN SERUM

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The bedside method of determining the serum bicarbonate level described previously [1] provided a simple, rapid means of obtaining information for a rough clinical appraisal of acid-base balance. The improved method, described here, preserves all the advantages of the previous method, is two to four times more accurate, and is easier to perform. In the improved method, phenol red replaces diphenylcarbazone as the pH indicator. This is advantageous for several reasons. 1. Phenol red is stable, while diphenylcarbazone is not. 2. During the titration phenol red does not develop interfering purple colors as diphenylcarbazone often does. 3. The end point is sharper with phenol red than with diphenylcarbazone.

A further improvement has been made by finding simple means of limiting the main source of error in the bedside bicarbonate method—a variation in the amount of dissolved carbon dioxide remaining in the sample during titration. More thorough agitation before titration and a new titrating technique serve to reduce this error. The method to be described is complete in itself although it can be combined with the bedside method for either total base (see this issue, page 639) or chloride.[3]

From the Veterans Administration Hospital and the Department of Medicine, University of Washington.

Work on this project was aided in part by a grant from Abbott Laboratories, North Chicago, Ill.

The methods presented in this paper will be demonstrated as a scientific exhibit at the 103rd Annual Meeting of the American Medical Association in San Francisco, June 21-25, 1954.

1. Scribner, B. H.: Bedside Determination of Bicarbonate in Serum, Proc. Staff Meet., Mayo Clin. **25**: 641-648 (Nov. 22) 1950.

2. Deleted on proof.

3. Scribner, B. H.: Bedside Determination of Chloride: A Method for Plasma, Urine, and Other Fluids and Its Application to Fluid Balance Problems, Proc. Staff Meet., Mayo Clin. **25**: 209-218 (April 26) 1950.

PRINCIPLE OF THE METHOD

The bedside bicarbonate method, an adaptation of the titrimetric procedure of Van Slyke and others,[4] is performed by adding a measured excess of standard acid to a sample of plasma or serum. This acid reacts with the bicarbonate and converts it to carbon dioxide, which is allowed to escape. The sample is then titrated with a standard alkali back to the original pH of 7.4; the effect of serum buffers on the acid is thus cancelled out. The end point is determined by comparing the sample with a permanent color standard. This color standard is an aqueous buffer at pH 7.4,[5] which contains the same concentration of phenol red as the sample. Solutions are measured with tuberculin syringes and reagent strengths are adjusted so that the result can be read directly from the scale of the syringe.

REAGENTS [6]

Standard carbonate solution (25 mEq./liter).—Weigh out 1.32 gm. of dry, reagent grade, anhydrous sodium carbonate (Na_2CO_3) and 5.85 gm. of dry sodium chloride. The inclusion of sodium chloride makes this solution suitable for the standard in the chloride [3] and total base (see this issue, page 639) procedures. Dissolve these salts in distilled water and dilute to one liter. This reagent is used to standardize the bicarbonate procedure.

Standard 0.1 N nitric acid.—Dilute 7 ml. of concentrated nitric acid to one liter with distilled water. Using a volumetric pipet, measure 4 ml. of standard carbonate solution into the titrating test tube. Add one drop of an indicator, such as methyl orange, with an end point in the pH 4 to 5 range. Titrate the carbonate sample with the roughly diluted nitric acid to the first definite color change toward amber red, using a tuberculin syringe or buret. Note the result of the titration and then dilute the nitric acid until 1.00 ml. will react exactly with 4.00 ml. of the standard carbonate solution.

Standard 0.1 N sodium hydroxide.—Allow a saturated solution (about 110 gm. in 100 cc.) of sodium hydroxide to stand two to three days until the carbonate precipitates. (If time is limited, pellets from a freshly opened bottle of reagent grade sodium hydroxide may be used. Carbonate contamination, however, will be greater with this method.) Dilute 7 to 8 cc. of this strong base in about one liter of distilled water that has been boiled or aerated to remove excess carbon dioxide. (If this reagent is used also for the total base determination, it must be made up in 3.6% sodium nitrate.) Standardize against the 0.1 N nitric acid using methyl orange as the indicator. This standard sodium hydroxide should be stored in a tightly capped bottle, preferably polythene, and exposure to carbon dioxide should be avoided. The supply in the test set must be discarded when the 2 oz. bottle becomes one-half to two-thirds empty. The bottle is then rinsed twice with fresh base and refilled. This prevents the accumulation of carbonate precipitate in the bottom.

Indicator.—A 0.04% aqueous solution of phenol red or the water soluble sodium salt of phenol red may be purchased from laboratory supply houses. The solution is made by dissolving 400 mg. of the salt in one liter of distilled water.

SUPPLIES AND EQUIPMENT

Sample syringe.—A 1 cc. tuberculin syringe may be fitted with a 1.5 in. no. 20 needle in the usual manner. However, it is recommended that the shaft be cemented into the tip as follows (fig. 1*A*). Cut the hub off the shaft of the needle. Square its ends and be sure the lumen is patent. Seal the shaft into the tip of a 1 cc. tuberculin syringe, using DeKhotinsky or other strong, waterproof cement. Be sure the needle does not protrude into the syringe chamber. Mount the sample syringe in a syringe stop and adjust the volume to about 1 cc. Fit the syringe into the cap of a 2 oz. dropper bottle (the standard bottle used by pharmacies to dispense nose drops) after first cutting the top off the bulb and removing the glass tip. The revised dropper bulb becomes a bushing that holds the syringe in the plastic cap. Then fill the bottle with

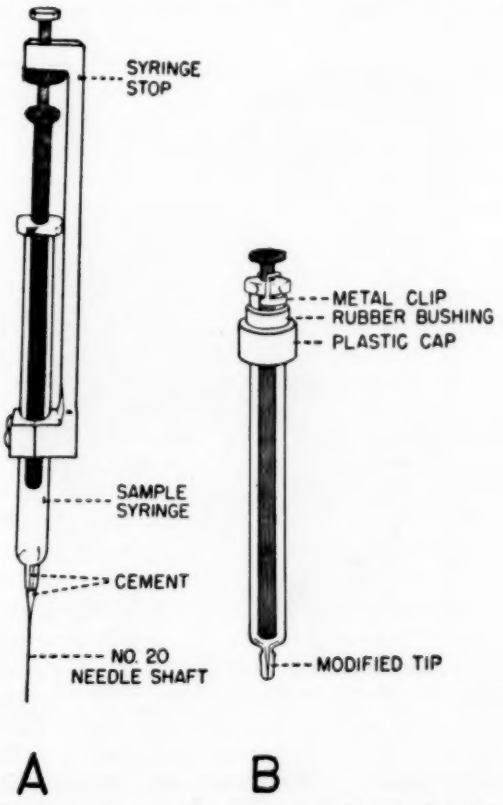

Fig. 1.—*A*, sample or acid syringe. (The cap from the 2 oz. bottle that fits just below the syringe stop has been omitted in the drawing.) *B*, titrating syringe.

distilled water. If the bedside tests are integrated, one sample syringe may be used for the bicarbonate and either the chloride [3] or the total base [2] test.

Acid syringe.—Following the instructions for the sample syringe, alter a second 1 cc. tuberculin syringe. Set the volume at 0.7 cc. Fill the bottle with standard acid.

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4. Van Slyke, D. D.; Stillman, E., and Cullen, G. E.: Studies in Acidosis: XIII. A Method for Titrating the Bicarbonate Content of the Plasma, J. Biol. Chem. **38**: 167-178 (May) 1919.

5. Van Slyke [4] recommended that the color standard be adjusted to pH 7.2 because phenol red has an indicator error of about 0.2 pH in solutions of protein. However, since the pH of serum at room temperature is actually about 7.6, the two errors cancel and the color standard adjusted to pH 7.4 is satisfactory.

6. All reagents and supplies including syringe stops and color standards may be obtained from Rochester Products Company, Rochester, Minn.

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A 1 cc. tuberculin syringe for sodium hydroxide titration.—This syringe should be modified as follows (fig. 1*B*). Rapidly rotate the tip in a Bunsen burner flame. As the glass softens, the orifice will slowly close. Allow this to proceed until the shrunken orifice will just admit the wire, which fits in a no. 23 to no. 24 gauge needle (approximately no. 38 gauge wire). The titrating syringe should also be fitted with the standard metal clip that steadies the plunger. This syringe may also be fitted into the cap of a 2 oz. dropper bottle. Fill the bottle with standard base.

Two or more titrating test tubes.—These should be about 1 in. in outside diameter and 4 in. long (Pyrex rimless culture tube no. 9820).

Color standard.—Heat the neck of a titrating test tube and pull it out to form a narrow constriction that may be sealed later to form an ampul. Place 2.5 cc. of pH 7.4 buffer made from *p*-Hydrone capsules in the ampul and

Fig. 2.—The correct position for titrating. Note that the syringe and test tube are held in the same hand and can be shaken as a unit to wash a fraction of a drop off the syringe tip. Note also the index finger steadying the plunger which is moved with the other hand. (From Scribner, B. H.: Proc. Staff Meet., Mayo Clin. **25**: 209-218 [April 26] 1950.)

add 0.25 ml. of 0.04% phenol red indicator. Seal the ampul and place it in boiling water for 30 minutes. While this sealed color standard will keep for an indefinite period, it should be checked about once a year by comparing it to a fresh standard made up in a regular titrating test tube.

Three test tubes or other vessels to hold the color standard and titrating test tubes.

A 2 oz. bottle to contain standard carbonate reagent.

A 2 oz. dropper bottle for phenol red indicator.

The bottles and test tube holders can be mounted in a box or taped together to form a test kit.

PROCEDURE

Obtain 3 cc. or more of blood by venipuncture in the usual manner. Place the blood in a clean dry tube of a volume not much larger than that of the sample. Stopper the tube and allow the clot to form. After the clot has retracted, the serum may be obtained directly; a larger volume may be obtained if the tube is centrifuged. Exposure to air should be minimal until the serum is separated from the cells. Plasma may also be used.

1. Draw about 0.1 ml. of the serum or plasma sample to be tested into the sample syringe. Then, with the syringe pointing upward, draw the plunger out all the way and return it to zero. This rinses the syringe with sample and eliminates bubbles.

2. Fill the sample syringe with serum and deliver into the titrating test tube. (The volume setting on the sample syringe may be any volume near 1 cc. as long as it is kept constant. This permits the sample syringe to be used for either the total base [see this issue, page 639] or chloride [3] tests, which are standardized by altering sample volume.)

3. Fill the acid syringe with the correct volume (see section on standardization below) of 0.1 N nitric acid and deliver it into the titrating test tube.

4. Agitate the serum-acid mixture for not less than 2 minutes. It is best to use a rotary motion that washes the solution up on the sides of the tube but does not form bubbles. This is a most important step as inadequate swirling can cause a significant error. (If speed is essential, the specimen can be swirled for only 30 seconds; however, this decreases the precision of the test from ± 0.5 to ± 1 mEq./liter.)

5. Add exactly 5 drops of indicator.

6. Fill the alkali syringe with 0.7 cc. of 0.1 N sodium hydroxide. Place the syringe in the titrating test tube so that the tip can be washed with the sample (fig. 2). Lower the plunger slowly, rotating it to obtain better control. Swirl the solution constantly during the titration and keep the syringe tip continually washed in the solution. As the end point is approached, add the alkali even more slowly to avoid momentary persistence of red color. Even though the color may fade again, do not go beyond the end point. If the titration is carried out properly with sufficient agitation, the end point will be gradually approached and almost no fading will occur.

The end point is determined by comparing the sample color with that of the color standard. The shade rather than the depth of color is noted. This can be seen clearly only by tilting the tube and color standard above but not against a white surface and looking for the magenta hue or purplish cast in the thin layer of the liquid (fig. 3, page 642). An easy way to titrate, and at the same time to see the magenta hue, is to put a white towel in the lap, and, steadying the elbows against the sides of the abdomen, hold the sample and color standard above the towel. The magenta or purplish hue is seen best in daylight or bluish artificial light. This hue comes up suddenly with the addition of not more than 0.005 cc. (one-half division) of base.

To be sure the end point has been reached, note the reading on the syringe and then add 0.005 cc. (one-half division) more base. This should make the sample definitely more magenta than the color standard. If it does not, continue the titration. The beginner will tend to undertitrate.

7. The volume of sodium hydroxide left in the syringe, expressed in hundredths of a milliliter, equals the serum

bicarbonate in milliequivalents per liter. Multiplying this figure by 2.23 will give the result in volumes per cent. For example, if 0.24 ml. of alkali were left in the syringe at the end point, the serum bicarbonate level would be 24 mEq./liter or 53 vol. %.

STANDARDIZATION OF THE METHOD

Perform the bicarbonate determination as directed using the standard carbonate solution as the sample and filling the acid syringe to the 0.70 ml. mark. If the result obtained is 25 mEq./liter, then the method is standardized. If not, adjust the set screw on the syringe stop of the acid syringe up or down and repeat the test until a result of 25 mEq./liter is obtained on the standard solution. For example, if the end point were reached at 24 mEq./liter (1 mEq. low) it would be necessary to decrease the volume of acid.

Because the standard carbonate solution is unbuffered, the end point during the standardization titration is sharp and accurate, but there is more fading than with serum. If the red color lasts more than 30 seconds, the end point has been reached. Standardization of the bicarbonate method in this manner tends to compensate for errors in standardizing the acid and alkali and errors in the calibration of the syringes. The set should be restandardized frequently and whenever new reagents or syringes are used. It is a simple matter to run the standard right along with an unknown. If an incorrect result is obtained on the standard, the result on the unknown may be adjusted accordingly.

ACCURACY OF THE METHOD

With practice, it is possible to obtain duplicate checks on a sample of serum that agree within ± 0.5 mEq./liter. On 31 consecutive samples of serum, results by the improved bedside method were compared with those obtained by the volumetric method of Van Slyke.[7] The standard deviation was 0.8 mEq./liter. The mean value with the bedside method was 0.27 mEq./liter higher than the mean value with the Van Slyke method.

The following conditions may give an erroneous determination of the bicarbonate level.

Severe jaundice or hemolysis.—When the serum bilirubin is 5 mg. per 100 cc. or above, a premature end point causes results to be high by as much as 1 to 5 mEq./liter. This error can be minimized by adding about 3 dropperfuls (2 cc.) of distilled water and 5 additional drops of indicator before the 2 minute agitation.

Carbonate contamination of sodium hydroxide.—Although the sodium hydroxide need not be carbonate free, large contaminations will give low results. Therefore, it is important to keep the sodium hydroxide as free of carbonate as possible by carefully observing the precautions mentioned in the section on reagents. If desired, carbonate contamination can be checked as follows: Place about 10 ml. of 0.1 N sodium hydroxide in a 15 ml. graduated centrifuge tube. Add about 1 ml. of normal barium chloride. Allow precipitate to settle for 1 hour. If volume of precipitate exceeds 0.15 ml., carbonate contamination exceeds 2%, which is unsatisfactory.

Abnormal blood pH.—A potential source of error is a deviation of the patient's venous blood pH from normal levels of about 7.4. Van Slyke [8] and Nadeau [9] advocate eliminating this error by making the color standard out of an anaerobically obtained sample of the patient's serum. We believe this complicated elaboration of the technique is unnecessary, since a marked deviation of blood pH is rare and the error introduced is small. When a marked alteration in blood pH is suspected, the pH can be determined directly and the bicarbonate result corrected as follows: For every 0.1 pH the venous blood is below 7.4 (38 C), add 0.5 mEq./liter to the result obtained. The correction factor should be subtracted when the blood pH is elevated.

INTEGRATION WITH OTHER BEDSIDE TESTS

It was previously suggested [1] that the bedside chloride test [3] could be performed on the same sample after the bicarbonate determination is completed. This can still be done if the following are observed. 1. The sample must be measured with the sample syringe standardized for the chloride test. 2. The bicarbonate test must be standardized after the chloride test so the same volume of serum may be used for each test. 3. The chloride indicator (diphenylcarbazone) must be added after the bicarbonate test is completed. 4. Because phenol red is present, the chloride end point is a change from yellow to brown instead of from colorless to purple. The integration of the bicarbonate test with the bedside test for total base is fully discussed elsewhere. However, it is impossible to integrate the bicarbonate test with both the chloride test and the total base test at the same time.

SUGGESTED APPLICATIONS

Although this is indeed a bedside method intended primarily for use by physicians, it is as accurate as routine laboratory methods for determining serum bicarbonate (or carbon dioxide combining power, which, for practical purposes, is the same). Many clinical laboratories, especially those in small hospitals and in rural communities, do not perform serum bicarbonate determinations. Other laboratories perform this test so infrequently that their results obtained by standard methods are subject to great inaccuracies. This bedside technique for bicarbonate should, therefore, be useful in many clinical laboratories because of its simplicity and reliability. Reliability is assured because a bottle of standard is included in the test set. If a questionable result is obtained on a sample, a determination may be done with the standard. In effect, the bedside technique permits a comparison of the unknown serum with a standard of known composition. Such a comparison is not possible with other methods.

It may be desirable, particularly in testing the serum of infants, to reduce the sample size to 0.5 cc. or even 0.25 cc. The best results on such small quantities of serum are obtained by reducing the strength of the standard acid and base to 0.05 N if a 0.5 cc. sample is used, or 0.025 N if a 0.25 cc. sample is used. In either instance, four drops of indicator instead of five are used. The method otherwise is exactly the same.

7. Van Slyke, D. D.: Studies of Acidosis: II. A Method for the Determination of Carbon Dioxide and Carbonates in Solution, J. Biol. Chem. **30**: 347-368, 1917.

8. Van Slyke, D. D.: Determination of Bicarbonate of Blood and Plasma, abstracted, J. Biol. Chem. **50**: 16-17 (Feb.) 1922.

9. Nadeau, G.: Simple Method for Combined Determination of Plasma Bicarbonate, pH and Chloride, Am. J. Clin. Path. **23**: 710-712 (July) 1953.

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When the sample size is decreased, the precision of the method is decreased somewhat also. It is particularly important to realize that when the strength of the sodium hydroxide is decreased to accommodate the smaller volumes of sample, the errors due to carbonate contamination of the base are potentially much greater. Therefore, the precautions mentioned in the section on reagents should be followed with great care.

If the bicarbonate sample size is decreased to 0.5 cc., the chloride test can still be performed on the same sample. However, the reading on the chloride titrating syringe must be doubled when the chloride concentration is calculated.[3]

SUMMARY AND CONCLUSIONS

An improved bedside method for the determination of bicarbonate in serum uses phenol red instead of diphenylcarbazone as the pH indicator. It is superior to the original method for the following reasons. 1. The indicator, phenol red, is stable. 2. Interfering purple color does not develop during the titration. 3. The end point is sharper. Although the sample contains phenol red, the chloride level may still be determined on the same sample that is used for the bicarbonate determination. The improved bicarbonate method is sufficiently accurate to replace the volumetric procedure of Van Slyke [7] as a routine procedure in the clinical laboratory.

4435 Beacon Ave. (8) (Dr. Scribner).

CLINICAL NOTES

MESENTERIC VASCULAR OCCLUSION

A REPORT OF TWO CASES

Thomas G. Orr Jr., M.D.
Paul H. Lorhan, M.D.
and
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In recent years, a rather definite upsurge in interest in the problem of mesenteric vascular occlusion has occurred, evidenced by the increasing number of articles that have appeared on the subject. It is generally accepted that this interest was first stimulated by Tiedeman's [1] report in 1843. Allbutt [2] attributes the first description of mesenteric thrombosis to Antonio Beniviene of Florence in the 15th century. In 1895, Elliot [3] reported the first successful resection of an intestinal infarction with vascular occlusion. Mersheimer, Winfield, and Fankhauser [4] recently accumulated reports from the literature describing 212 successful resections for mesenteric vascular occlusion and added 5 of their own cases. Their bibliography is probably as complete a compilation as it is possible to make.

Mesenteric vascular occlusion is a complex that may be caused by venous thrombosis, arterial embolism, arterial thrombosis, rupture of mesenteric vessels, or vascular trauma. Concern in this paper is with only the first three types. These in turn are classified into the idiopathic or agnogenic and secondary forms. Berry and Bougas [5] reported that 24% of their 53 cases of mesenteric venous thrombosis fell into the agnogenic group, and Johnson and Baggenstoss [6] found 8% in this group in a similar series of 99 cases. Secondary venous thrombosis of the mesenteric vessels is predicated upon mechanical obstruction (cirrhosis, extrabiliary portal hypertension, neoplasms), infection, or blood dyscrasias.

It is not our intent to review the entire subject of mesenteric vascular occlusion but rather to present a report of two cases in which the features are somewhat unique.

CASE 1.—A well-developed, well-nourished white man, age 78, was admitted to the hospital on Aug. 21, 1952, after the sudden onset of severe midabdominal pain. This pain was persistent and cramping in type. Several times before his admission, he had vomited previously ingested food. He had had repeated urges to defecate, all without results. Examination showed the patient to be in obvious pain. His skin was pale and moist. His temperature was 97 F, blood pressure 170/110 mm. Hg, and pulse rate 130. The chest was normal for a man of his age. Palpation of the abdomen showed an extremely tender mass with poorly defined margins in the lower abdomen extending into the right lower quadrant. There was a suggestion of nodularity of its surface. Percussion was dull over the mass, which persisted after catheter drainage of the bladder. Nothing abnormal was found by rectal examination. Intestinal sounds were absent over the entire abdomen.

The past history contained nothing of importance other than that he had been receiving digitalis for an indefinite period for hypertensive heart disease after a single episode of cardiac failure. As far as is known, his heart had never been in auricular fibrillation. A roentgenogram of the abdomen taken with the patient in an upright position showed no evidence of dilated loops of intestine but did show an over-all "ground glass" appearance with some obliteration of the psoas muscle shadows. There were 5,570,000 red blood cells, the hemoglobin level (Sheard and Sanford method) was 18.1 gm., and there were 17,000 white blood cells, with 85% polymorphonuclear leukocytes. The electrocardiogram showed only the effects of digitalis.

A mesenteric vascular occlusion was suspected, and the patient was placed on a hydration regimen preparatory to abdominal exploration. The pulse rate rapidly increased to 160, the number of leukocytes rose to 19,000, and the level of blood pressure began to decline, so he was operated on about three hours after his admission to the hospital. When the abdomen was opened, a large quantity of grossly bloody fluid was evacuated. The entire small intestine was dark purplish-black in appearance, turgid in consistency, and covered with a very recent fibrinous exudate. No normal-appearing portion could be found. The tissues were handled gently for fear of tearing holes in the friable intestinal wall. The condition was deemed hopeless, and the abdomen was closed.

Postoperatively, supportive therapy was continued, and bilateral splanchnic nerve blocks were given, with 0.015% tetracaine (Pontocaine) hydrochloride in 10 cc. injections, repeated

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1. Tiedeman, F.: Von der Verengerung ans Schliessung der Pulsadern in Krankheiten, Leipzig, K. Gross, 1843.

2. Allbutt, T. C.: The Historical Relations of Medicine and Surgery to the End of the Sixteenth Century, London and New York, Macmillan & Company, 1905.

3. Elliot, J. W.: The Operative Relief of Gangrene of the Intestine Due to Occlusion of the Mesenteric Vessels, Ann. Surg. **21**: 9 (Jan.) 1895.

4. Mersheimer, W. L.; Winfield, J. M., and Fankhauser, R. L.: Mesenteric Vascular Occlusion: Report of 5 Successful Resections, A. M. A. Arch. Surg. **66**: 752 (June) 1953.

5. Berry, F. B., and Bougas, J. A.: Agnogenic Venous Mesenteric Thrombosis, Ann. Surg. **132**: 450 (Sept.) 1950.

6. Johnson, C. C., and Baggenstoss, A. H.: Mesenteric Vascular Occlusion: I. Study of 99 Cases of Occlusion of the Veins, Proc. Staff Meet., Mayo Clin. **24**: 628 (Dec.) 1949; II. Study of 60 Cases of Occlusion of the Arteries, and of 12 Cases of Both Arteries and Veins, ibid. **24**: 649 (Dec.) 1949.

every six hours. Massive doses of antibiotics were given. On the third postoperative day, the patient's condition was still much the same as it had been on the first day, so it was decided to operate again. At the second operation, only about 30 cm. of terminal ileum were found to be gangrenous. The remainder of the small intestine appeared normal. The gangrenous segment was resected, and an end-to-side ileocecostomy was done. The pathologist's report was "embolus of the mesentery artery with infarction of ileum."

Postoperatively, the patient's recovery was rather protracted, but he steadily improved. He had a persistent diarrhea, which was found to be a steatorrhea when the stools were studied. This has been controlled reasonably well by a fat-restricted diet, apple powder, water soluble vitamins A and D, a multivitamin supplement, folic acid, and cyanocobalamin (vitamin B_{12}). He now has about two stools daily, is working regularly, and feels well. He was last seen for follow-up study in October of 1953, 14 months after surgery.

CASE 2.—A well-developed, slightly emaciated white woman, 51 years of age, was admitted to the hospital on Dec. 4, 1952. She complained of nausea, vomiting, and general malaise. She had had rheumatic fever at the age of 15 and recurring episodes of cardiac failure for three years prior to admission. Physical examination of the patient showed a blood pressure of 130/70 mm. Hg, a pulse rate of 108 that was irregular, and a temperature of 98 F. Bronchial breath sounds were heard in both lung bases without rales. There was a grade 2 systolic murmur at the apex of the heart without thrill. The liver was slightly enlarged. Numerous reddish-brown maculopapular areas, 2 mm. to 2 cm. in diameter, were present on the skin of both extremities. There was slight pitting edema of the legs. The left upper and lower quadrants of the abdomen were diffusely tender, but masses were not felt. The electrocardiogram showed auricular fibrillation with flutter rhythm. There were 5,850,000 red blood cells, the hemoglobin level (Sheard and Sanford method) was 101, there were 26,000 white blood cells, and the level of noprotein nitrogen was 78 mg. per 100 cc.

The patient was given therapy for the heart condition. A grossly bloody stool was passed on the second hospital day. Bloody stools continued, and the general condition of the patient deteriorated until the fourth hospital day at which time she was operated on. About 4 ft. of swollen, reddened hemorrhagic ileum was found. Since the intestine did not appear infarcted, the abdomen was closed without resection of the intestine. Postoperatively the patient did well. She was given supportive therapy, and continuous splanchnic nerve blocks through an inlying catheter, using 1% procaine. This latter treatment was discontinued on the second postoperative day. Antibiotics were used. Transfer of the patient to the medical service for management of the cardiac problem was made on the ninth postoperative day; here she had considerable trouble, though none was related to the original mesenteric vascular occlusion. Hematuria was noted several times; this was thought to be due to renal infarcts from emboli broken off from a cardiac mural thrombus. The same source is postulated for an embolus causing the mesenteric arterial occlusion.

Since discharge from the hospital, the patient has continued to have some ascites and dependent edema from heart failure and there has also been evidence of damage to the kidneys. She has improved in recent months, however, and was last seen in October of 1953, at which time she had no complaints referable to the gastrointestinal tract. Eleven months have elapsed since the operation.

COMMENT

As far as we have been able to learn, the concept of blocking the splanchnic nerves in the treatment of this condition has not yet been reported. Frankly, it was used as an experiment on a patient whose condition had been given a fatal prognosis at exploratory laparotomy. Fortunately, all three of the authors were present at the first operation, and all concurred in the opinion that resection was impossible. The entire small intestine was so turgid and edematous it was even feared that it might tear in handling. Only after closure of the abdomen did one of us (P. H. L.) suggest the use of splanchnic nerve blocks on the seemingly remote possibility that part of the appearance of the intestine might be a result of vascular spasm. Judging from the appearance of the intestine at the second operation, vascular spasm seems to have been more than a possibility. We do not intend to convey the impression that we are advocating conservative management of this problem. From our own experience and that reported by many others, we believe strongly that resection is the usual treatment of choice. We believe now that splanchnic block is also indicated in the therapy of this disease.

In consideration of the second case, in which resection was not considered necessary, another aspect of the problem presents itself. Laufman and Scheinberg [7] reported a case of spontaneous recovery from mesenteric vascular occlusion but admitted that the evidence for the diagnosis was equivocal. Reed, Jopson, and Despard [8] reported three similar cases, one of which was operated upon and the diagnosis confirmed. Klein [9] detailed eight cases clinically diagnosed as mesenteric vascular occlusion in which recovery was spontaneous, but only one of his patients had been operated on and the diagnosis proved. From this evidence, it is obvious that mild forms of occlusion occur without infarction of the intestine. It makes one wonder if some of the unexplained abdominal conditions often seen, and from which recovery is spontaneous, might not be mesenteric vascular occlusions of this nature. Until a specific diagnostic procedure is developed, short of laparotomy, to accurately establish the presence or absence of vascular occlusion, this must remain only speculation.

Mersheimer and his associates have stated that it may occasionally be necessary to terminate the surgical procedure if evidence of incomplete demarcation of an infarct of the intestine is present but only when the acknowledged intent is for definitive resection at an early date. We believe that in such circumstances that splanchnic nerve block to eliminate vasospasm would be most valuable. From the admittedly meager though convincing evidence at hand, it appears that the progress of such a process might be halted or even made to regress and, in those cases in which frank infarction had not yet occurred, might even be aborted by the use of splanchnic nerve block. However, it should not be inferred that the nerve block is intended to replace the "second look," which may be necessary even though it may be found at the second operation that resection is not indicated.

It should be emphasized that intestine with impaired circulation may be viable in spite of its dark appearance. We now doubt our ability to draw a sharp line between viable and nonviable intestine upon its appearance, unless frank necrosis with slough has developed.

SUMMARY

In cases of mesenteric vascular occlusion in which a fatal prognosis is given at surgery, or in which resection at first seems inadvisable, reoperation is indicated when

7. Laufman, H., and Scheinberg, S.: Arterial and Venous Mesenteric Occlusion: Analysis of 44 Cases, Am. J. Surg. **58**: 84 (Oct.) 1942.

8. Reed, L. B.; Jopson, J. H., and Despard: Case Reports: Transactions of the Philadelphia Academy of Surgery, Ann. Surg. **74**: 792 (Dec.) 1921.

9. Klein, E.: Embolism and Thrombosis of the Superior Mesenteric Artery, Surg., Gynec. & Obst. **33**: 385 (Oct.) 1921.

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the clinical condition of the patient shows no deterioration or improvement after a few days' observation. That vasospasm may be associated with mesenteric vascular occlusion and that vasospasm may be benefited by splanchnic nerve block is suggested by the favorable outcome in these cases, which in case 1 later permitted resection and in case 2 resulted in spontaneous recovery.

TREATMENT OF SUBACUTE THYROIDITIS WITH CORTICOTROPIN

Milton Cutler, M.D., Hammonton, N. J.

Three distinct entities comprise most cases of subacute or chronic nonsuppurative thyroiditis: subacute nonsuppurative giant cell thyroiditis, struma lymphomatosa (Hashimoto's disease), and Riedel's struma (woody or ligneous thyroiditis). In the past it was believed that these represented stages in the progression of the same disease, but recent clinical and pathological studies have shown them to be separate diseases. Subacute nonsuppurative thyroiditis has also been called pseudotuberculous or giant cell thyroiditis because of the formation of tiny miliary pseudotubercles by polymorphonuclear infiltration of colloid follicles. The cause is unknown. Clinically, the disease is characterized by a painful, tender, firm, usually diffuse enlargement of the thyroid gland, with fever, pain on swallowing, hyperthyroidism at least in the beginning of the disease, elevated sedimentation rate, and polymorphonuclear leukocytosis. The disease is usually self-limited; it runs a variable course for weeks or months and eventually subsides without any permanent impairment of thyroid function, although an early hypermetabolism and a later hypometabolism have been observed. These changes probably reflect inflammatory stimulation of the gland, followed by depression and exhaustion. Struma lymphomatosa or Hashimoto's disease is a rare progressive disease of the thyroid, possibly associated with systemic disorders in which there is extensive acidophilic degeneration of the epithelium with later infiltration of lymphoid and then fibrous tissue.[1] There is little pain, no fever, mild hypometabolism, and a tendency toward nodulation with diffuse involvement. Riedel's struma usually involves only one lobe of the thyroid, but may involve both. It is a chronic proliferating, fibrosing, inflammatory process that extends to involve the trachea, muscles, fascia, nerves, and vessels around the thyroid and produces a "wooden" mass that may be mistaken for a carcinoma. Crile [1a] states that in many instances the inflammatory reaction appears to center about a degenerative adenoma; this may be a clue to its cause. The course of this disease is slow, progressive, and usually painless. Two cases of subacute thyroiditis with excellent response to corticotropin (ACTH) are presented.

1. (*a*) Crile, G., Jr.: Thyroiditis, Ann. Surg. **127**: 640-654 (April) 1948. (*b*) Lasser, R. P., and Grayzel, D. M.: Subacute Thyroiditis, Struma Fibrosa, Struma Lymphomatosa: Clinical-Pathological Study, Am. J. M. Sc. **217**: 518-529 (May) 1949. (*c*) Graham, A., Struma Lymphomatosa (Hashimoto), Tr. Am. A. Study Goiter, pp. 222-251, 1940. (*d*) Joll, C. A.: Pathology, Diagnosis and Treatment of Hashimoto's Disease (Struma Lymphomatosa), Brit. J. Surg. **27**: 351-389 (Oct.) 1939.

2. King, B. T., and Rosellini, L. J.: Treatment of Acute Thyroiditis with Thiouracil: Preliminary Report, J. A. M. A. **129**: 267-268 (Sept. 22) 1945.

REPORT OF CASES

CASE 1.—A 67-year-old woman, when seen on March 13, 1953, had a painful, tender swelling of the neck and complained of generalized weakness for the preceding month. She had been receiving prophylthiouracil, 200 mg. daily for two weeks, then 150 mg. daily for two weeks. In spite of this treatment, the condition became progressively worse. Thirty years previously she had had a similar painful, tender swelling of the neck that persisted for six months despite iodine medication. The swelling had disappeared the day after a gynecologic operation and did not return until the onset of the present illness. Examination showed that the thyroid gland was enlarged, especially the left lobe, and the entire gland was tender and quite hard. The patient's blood pressure was 150/90 mm. Hg, and the pulse rate was 102 per minute; the other physical findings were essentially normal. The serum protein-bound iodine level was 10.2 mcg. per 100 ml., the blood cholesterol was 250 mg. per 100 cc., and the sedimentation rate, according to the Cutler method, was 26 mm. in one hour.

The patient was given corticotropin gel (highly purified ACTHAR Gel) intramuscularly, 40 units daily for four days and 20 units on the fifth day. Within eight hours after the first dose, the pain and tenderness disappeared. The weakness improved rapidly in two days, and the swelling, particularly that of the left lobe, was reduced about 75% in one day, disappearing entirely within three days. One week later, the painful, tender swelling of the thyroid gland and weakness returned, all within one day. The same therapeutic regimen was instituted except that one day less of corticotropin gel treatment was given. The results were similar, and improvement occurred within six hours. The patient had a second relapse within 10 days, for which two days of corticotropin therapy was given, and a third relapse six days thereafter, for which only one injection (60 units) of corticotropin gel was given. On May 9, 1953, the patient had a fourth and final relapse, for which one dose of 80 units of corticotropin gel was administered. In all these instances the improvement was just as rapid and complete. Protein-bound iodine concentration on May 9, 1953, was 3.2 mcg. per 100 ml., and on May 23, 1953, was 2.8 mcg. per 100 ml. The sedimentation rate on May 23 was 16 mm. in one hour. Although no signs or symptoms of hypothyroidism were present, 3 grains (190 mg.) of thyroid was given daily; this dosage was gradually reduced over a four month period and terminated Oct. 1, 1953. Protein-bound iodine concentration on Nov. 1, 1953, was 3.8 mcg. per 100 ml., and cholesterol was 258 mg. per 100 cc. of blood.

CASE 2.—A 44-year-old woman, seen on May 2, 1953, had a painful, tender swelling of the neck of about six weeks' duration. General physical examination revealed an essentially normal status, except for a blood pressure of 190/94 mm. Hg and a pulse rate of 92 per minute. Examination of the thyroid gland revealed a tender, hard nodule, about 2 cm. in diameter, in the lateral half of the right lobe. The remainder of the thyroid was slightly enlarged and not as hard as the nodule but definitely firmer than normal. In view of the possibility of carcinoma, surgery was advised, but a trial of corticotropin was agreed on. Within 12 hours after receiving the first dose of corticotropin gel (80 units), the patient had relief of symptoms, and the nodule had decreased to about one-half of its original size, decreasing more slowly within the next eight days until it had disappeared. Dosage was decreased after the first three days to 60 units for two days, then 40 units, and finally 20 units for the last two days. On the first day of treatment the serum protein-bound iodine level was 8.8 mcg. per 100 ml., the blood cholesterol 248 mg., and the sedimentation rate 22 mm. in one hour. Six weeks later the protein-bound iodine level was 6.4 mcg. per 100 ml., the blood cholesterol 228 mg., and the sedimentation rate 8 mm. in one hour. Examination six months after discontinuation of corticotropin therapy revealed no return of symptoms, or signs.

COMMENT

Subacute thyroiditis and Riedel's struma have both been treated by roentgen therapy. The former has also been treated with thiouracil,[2] and Riedel's struma has

been treated successfully with large doses of desiccated thyroid. Corticotropin serves as an excellent therapeutic agent for subacute thyroiditis and struma lymphomatosa.[3] Lasser [1b] has suggested the use of corticotropin and cortisone until the sedimentation rate is normal, since recrudescence is the rule. In addition to their anti-inflammatory effect, these drugs may depress thyroid activity, since they have been shown to depress uptake of radioactive iodine.[4] In the first case presented, it is attractive to postulate the alarm reaction to surgery which terminated the first attack 30 years ago. In the second case, corticotropin served as an important aid in the differentiation of a possible carcinoma of the thyroid gland.

SUMMARY

Two cases are presented of subacute thyroiditis showing prompt cessation of symptoms after corticotropin (ACTH) administration. Corticotropin therapy served to differentiate a possible malignant lesion of the thyroid from subacute thyroiditis.

554 Bellevue Ave.

3. Crile, G., Jr., and Schneider, R. W.: Diagnosis and Treatment of Thyroiditis with Special Reference to the Use of Cortisone and ACTH. Cleveland Clin. Quart. **19**: 219-224 (Oct.) 1952. Lasser and Grayzel.[1b]

4. Perry, W. F.: The Action of Cortisone and ACTH on Thyroid Function. Endocrinology **49**: 284-288 (Aug.) 1951.

COUNCIL ON FOODS AND NUTRITION

ACCEPTED FOODS

The following products have been accepted as conforming to the rules of the Council.

JAMES R. WILSON, M.D., *Secretary.*

Dorset Foods, Ltd., Long Island City, New York.

Dorset Brand Diet Pack Beef Stew.

Ingredients: Beef, cooked; potatoes; carrots; peas; and gravy consisting of water, tomato paste, beef fat, flour, onion powder, caramel, and spices (no sugar or salt added).

Analysis (submitted by manufacturer).—Total solids 25.47%, moisture 74.53%, fat (ether extract) 7.47%, protein (N × 6.25) 6.99%, ash 0.55%, crude fiber 0.67%, carbohydrates other than crude fiber (by difference) 9.79%, and sodium 20 mg. per 100 gm.

Vitamins and Minerals	Per 100 Gm.
Thiamine	7.7 mcg.
Riboflavin	59.0 mcg.
Niacin	0.81 mg.

Calories.—1.34 per gram; 38 per ounce.

Use.—In sodium-restricted diets.

Dorset Brand Diet Pack Chicken Vegetable Dinner.

Ingredients: Chicken, carrots, string beans and gravy consisting of chicken broth, dehydrated onion powder, lemon juice and spices (no sugar or salt added).

Analysis (submitted by manufacturer).—Total solids 21.85%, moisture 78.15%, fat (ether extract) 3.34%, protein (N × 6.25) 8.08%, ash 0.59%, crude fiber 0.86%, carbohydrate other than crude fiber (by difference) 8.98%, and sodium 25 mg. per 100 gm.

Vitamins and Minerals	Per 100 Gm.
Thiamine	3.9 mcg.
Riboflavin	82 mcg.
Niacin	2.39 mg.

Calories.—0.98 per gram; 28.8 per ounce.

Use.—In sodium-restricted diets.

Dorset Brand Diet Pack Condensed Chicken Broth.

Ingredients: Chicken broth, chicken fat, onion powder, and spices (no sugar or salt added).

Analysis (submitted by manufacturer).—Total solids 2.52%, moisture 97.48%, ash 0.87%, fat (ether extract) 0.32%, protein (N × 6.25) 1.25%, crude fiber 0.04%, carbohydrate other than crude fiber (by difference) 0.04%, and sodium 10.7 mg. per 100 gm.

Calories.—0.08 per gram; 2.0 per ounce.

Use.—In sodium-restricted diets.

Dorset Brand Diet Pack Chicken Rice Dinner.

Ingredients: Chicken, rice, and gravy (consisting of chicken broth, potato starch, lemon juice, onion powder, paprika, and spices—no sugar or salt added).

Analysis (submitted by manufacturer).—Total solids 15.80%, moisture 84.20%, ash 0.37%, fat (ether extract) 3.76%, protein (N × 6.25) 8.31%, crude fiber 0.56%, carbohydrate other than crude fiber (by difference) 2.80%, and sodium 21 mg. per 100 gm.

Calories.—0.78 per gram; 22.1 per ounce.

Use.—In sodium-restricted diets.

Aslesen Company, Minneapolis.

Banquet Table Brand Dietetic Pack Apricots.

Ingredients: Apricots packed in water without any added sugar or salt.

Analysis (submitted by distributor).—Total solids 8.2%, moisture 91.8%, ash 0.4%, fat (ether extract) 0.1%, protein (N × 6.25) 0.5%, crude fiber 0.3%, carbohydrates (by difference) 6.9%, ascorbic acid 3.9 mg. per 100 gm., and sodium 3.36 mg. per 100 gm.

Calories.—0.31 per gram; 8.8 per ounce.

Use.—In low calory, low sodium, and other therapeutic diets.

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Libby's Orange Juice for Babies.

This product is prepared from Florida oranges. It is processed and stored according to standards adopted by Libby, McNeill & Libby, which have been examined and accepted by the Council. The following information was submitted by the company. The juice is finely strained; the peel oil content is maintained at a point below 0.01%; dextrose in small amounts is added, when needed, for the maintenance of a sugar-acid ratio within specified limits; and the product is vacuum packed in 4½ oz. metal containers. The average ascorbic acid (vitamin C) content for the 1953 pack was 50.1 mg. per 100 ml.

H. J. Heinz Company, Pittsburgh.

Heinz Strained Soup, Macaroni, Tomatoes, Beef and Bacon.

Ingredients: Cooked macaroni; tomatoes (or tomato solids); beef broth; beef; wheat flour; cream; carrots; bacon; yeast, brewer's; yeast, autolyzed; whole milk powder; sugar; celery; salt; onions and sufficient water to prepare properly.

Analysis (submitted by manufacturer).—Total solids 14.86%, moisture 85.14%, ash 1.14%, fat (by acid hydrolysis) 2.69%, protein (N × 6.25) 2.08%, crude fiber 0.19%, total sugar as sucrose 2.11%, natural reducing sugar 1.32%, acidity as acetic 0.19%, salt 0.95%, and starch 6.59%.

Vitamins and Minerals	Per 100 Gm.
Vitamin A activity	720 I.U.
Thiamine	181 mcg.
Riboflavin	134 mcg.
Niacin	1.06 mg.
Calcium	28 mg.
Phosphorus	45 mg.
Iron	0.36 mg.
Copper	0.095 mg.

Calories.—0.67 per gram; 19.2 per ounce.

Use.—In the feeding of infants, convalescents, and others requiring a soft diet.

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TEMPORAL LOBE EPILEPSY

Huhlings Jackson in 1870 advanced the hypothesis that every epileptic seizure originates in some area of cerebral gray matter. Bailey and Gibbs [1] have pointed out that confusional episodes, in which the patient performs apparently purposeful but coarse and poorly coordinated movements, are usually associated with an epileptic focus in one or both anterior temporal regions. Gibbs and his co-workers [2] referred to such attacks as psychomotor seizures. This type of epilepsy occurs in about one-third of adult epileptics. These observations were made largely on electroencephalographic evidence. The electroencephalogram reveals seizure discharges in a high percentage of cases only when the tracing is made during natural or induced sleep.

In the experience of Penfield and Flanigin [3] temporal lobe seizure constitutes one of the largest groups among those who have epileptic attacks. The epileptic aura in this type of case may be of the abdominal, cephalic, or olfactory kind. There may be psychical phenomena such as hallucinations, illusions of perception, and automatism. Earle, Baldwin, and Penfield [4] found in an analysis of 157 cases of seizures originating in the temporal lobe that in 100 of these the pathological findings suggested that compression or anoxia during birth or infancy was the cause.

The diagnosis was in many cases made on roentgenograms showing asymmetry of the skull, with relative smallness of the temporal fossa and elevation of the petrous ridge on the side of the atrophic temporal lobe. These authors considered such findings as evidence that the atrophy had been produced within the first two years of life, probably at the time of birth. In most cases the preoperative electroencephalogram indicated an origin of abnormal potentials in the temporal lobe. A few cases of the electroencephalographic abnormalities seemed to be bitemporal, but the pattern of seizure onset made it obvious that the focus must be deep in one temporal region. Electrocorticograms taken at the time of operation usually showed the major abnormality to be present on or near the area of gross abnormality. In many cases electrical stimulation in these areas reproduced the initial phenomenon or warning aura of the patient's attacks.

The commonest abnormality found in their cases consisted of sclerotic areas of cortex in the inferior and medial part of the temporal lobe. The hippocampal gyrus and part of the first temporal gyrus were usually involved. Microscopic studies of the excised area usually revealed an increase in fibrous astrocytes in the gray and white matter. The location of this sclerotic change was the same in almost every case. It was most intense in that part of the temporal lobe that is next to the midplane and lies upon the free edge of the tentorium. The authors advanced the interesting hypothesis that the particular portion of the temporal lobe might be caused to herniate through the incisura of the tentorium as the result of head compression during birth. If herniation did occur at that time the flow of blood through the arteries that crossed the incisura could be arrested temporarily. To put this supposition to test, Earle and Baldwin bound the heads of stillborn infants with an elastic bandage under some pressure. After this the head was frozen solid, and the cranium was then sawed through. Herniation had occurred, and probably were the child alive the flow of blood through the artery that crosses the incisura would be temporarily arrested. It appeared clear, therefore, that temporary compression of these arteries might produce an ischemic lesion of the first temporal convolution anteriorly and deep in the fissure of Sylvius. The authors call this particular lesion "incisural sclerosis."

In the last four years Penfield and his co-workers [5] have operated on 155 patients for temporal lobe epilepsy. During the same period, only 121 patients were operated on for lesions elsewhere in the brain. The patients selected for surgical intervention were those who did not respond to the best medical therapy. When temporal lesions are unilateral in such patients, partial temporal lobectomy seems to offer a 50% chance of cure and a 25% promise of improvement with comparatively little risk of life.

1. Bailey, P., and Gibbs, F. A.: The Surgical Treatment of Psychomotor Epilepsy, J. A. M. A. **145**: 365-370 (Feb. 10) 1951.
2. Gibbs, F. A.; Gibbs, E. L., and Lennox, W. G.: Cerebral Dysrhythmias of Epilepsy: Measures for Their Control, Arch. Neurol. & Psychiat. **39**: 298-314 (Feb.) 1938.
3. Penfield, W., and Flanigin, H.: Surgical Therapy of Temporal Lobe Seizures, Arch. Neurol. & Psychiat. **64**: 491-500 (Oct.) 1950.
4. Earle, K. M.; Baldwin, M., and Penfield, W.: Incisural Sclerosis and Temporal Lobe Seizures Produced by Hippocampal Herniation at Birth, A. M. A. Arch. Neurol. & Psychiat. **69**: 27-42 (Jan.) 1953.
5. Penfield, W.: Temporal Lobe Epilepsy, Brit. J. Surg. **41**: 337-343 (Jan) 1954.

THE RELATION OF TRAUMA TO CORONARY THROMBOSIS

There appears to be a difference of opinion as to whether trauma causes coronary thrombosis. Trauma in this connection is understood to include physical or emotional stress. This is a matter of special importance to the physician who wishes to give sound advice for the prevention of such an occlusion and to those who have to decide workmen's compensation cases. Master and Jaffe [1] believe that much of the confusion in this matter could be resolved by realizing that acute coronary disease may be acute coronary occlusion or acute coronary insufficiency and that careful differentiation of these two conditions is essential for proper treatment of the patient and for a just appraisal of compensability. They state that this differentiation can be made in 95% of

1. Master, A. M., and Jaffe, H. L.: Factors in the Onset of Coronary Occlusion and Coronary Insufficiency: Effort, Occupation, Trauma, and Emotion, J. A. M. A. **148**: 794-798 (March 8) 1952.

cases by examining serial electrocardiograms in respect to certain differential points. Most observers admit that some form of trauma is usually the cause of coronary insufficiency. With regard to coronary occlusion there are some who believe that a history of an immediately preceding trauma is encountered too frequently to be considered purely coincidental. Another group believed that all but a few cases of coronary thrombosis occur in the absence of effort, usually at night when the blood pressure is low and the circulation is slow; they believe that in cases closely associated with trauma, this association is a matter of chance.

Definite criteria have been set up for establishing a causal relationship between trauma and coronary occlusion. According to Kapp [2] there must be a history of trauma preceding the coronary thrombosis and myocardial infarction and an immediate onset of disabling cardiac symptoms after the trauma. There must be a gradual and continuous development of these symptoms in the succeeding hours or days. The clinical diagnosis of coronary thrombosis and myocardial infarction should be corroborated by electrocardiogram. According to Boas [3] the causal relationship exists if the cardiac symptoms appear immediately after the trauma and are disabling or if they appear immediately and progress unremittingly to disability in a matter of a few days.

Sprague [4] points out that myocardial infarction may be caused by thrombosis due to lowered coronary blood pressure or by rupture of an atheromatous abscess due to elevated coronary blood pressure. Kapp believes that too many factors are involved in the production of coronary thrombosis to allow a sharp clinical distinction to be made between this condition and coronary insufficiency. In his series of 42 cases, evidence of relationship between coronary thrombosis and trauma was definite or possible in 19, doubtful in 5, and lacking in 18. In his appraisals special consideration was given to (1) the time interval between trauma and the onset of symptoms, (2) the nature and severity of the trauma or the degree of physical or emotional strain, and (3) the relation of trauma or strain to the usual occupation or habits of the patient. Master and Jaffe point out the difficulty of getting a true history in industrial cases even when there is no deliberate intention to deceive. Boas found that 21% of attacks of coronary thrombosis occurred when the patient was engaged in greater than usual physical activity as compared to only 2% found by Master and Jaffe.

Proper evaluation of these cases depends on (1) an honest history taken as soon after the onset as possible, (2) absence of impending litigation, (3) knowledge of the patient's condition prior to the trauma or strain, (4) knowledge of the patient's activities for a week preceding the onset, (5) knowledge of the patient's physical and emotional habits, (6) the degree of trauma or strain, (7) history of the events immediately following the trauma or strain, (8) objective evidence of cardiac injury, (9) knowledge of possible neurotic components, and (10) the autopsy findings or clinical findings when the patient has reached maximum improvement.

The occurrence of coronary thrombosis after trauma is probably not as rare or coincidental as some have claimed. Clinically and electrocardiographically it is often impossible to state when prolonged coronary insufficiency ends and myocardial infarction begins. No one questions the fact that most cases of coronary occlusion are spontaneous, but this does not preclude trauma as a cause in some cases. It is essential to approach the problem with an open mind and to pay particular attention to the use of correct terminology. It will always be difficult to appraise the causal relationship in some patients, but its determination is important because adequate treatment may be lifesaving, and timely advice may help to prevent future attacks. If there is a reasonable doubt whether a patient is suffering from coronary insufficiency or thrombosis, it would seem wise to treat him for the latter.

ACUTE EPISODES OF BRONCHIECTASIS

Prophylactic therapy of bronchiectasis may be continuous or intermittent, and it may necessitate the use of one or more drugs at alternate periods. Since the majority of bronchial infections are associated with gram-positive bacteria, penicillin is the drug of choice. This may be given orally in doses of 250,000 units two to three times daily. When there is considerable pulmonary fibrosis, aerosol penicillin given with the nebulizer in a dosage of 100,000 units three times daily may be used. Sulfadiazine, 1 to 3 gm. daily, has a definite place in bronchiectasis and may be substituted for penicillin. It is the most economical drug to use. The usual precautions for sulfadiazine should be observed. Some patients have had continuous therapy during the winter, and some appear to do better with intermittent therapy that is determined arbitrarily by trial. This may mean two weeks' therapy followed by a one to two week period without the drug. As soon as evidence of infection appears therapy is restarted.

Prolonged use of penicillin may cause overgrowth of gram-negative bacilli, in which case chlortetracycline (Aureomycin) and oxytetracycline (Terramycin) may be used in a dose of 250 mg. every 12 hours. The length of time that these antibiotics are used depends on the patient's reaction to them. Prolonged use of the broad-spectrum antibiotics is much more likely to cause difficulty than penicillin. Sputum cultures and resistance studies should be done for patients who have persistent episodes of infection, since these persons are apt to have organisms resistant to the usual agents used. In a number of the severest cases of bronchiectasis an effective method of prophylaxis has been intermittent therapy with alternate drugs. In the course of several months this might involve the use of penicillin, sulfadiazine, erythromycin, and chlortetracycline or oxytetracycline. There is no assurance that any form of prophylactic therapy will completely control acute episodes; however, most patients will benefit to some extent by the methods outlined. The important role of postural drainage in combination with all forms of therapy for bronchiectasis should be emphasized.

2. Kapp, L. A.: Trauma in Relation to Coronary Thrombosis. A Clinical Study of 42 Cases of Coronary Thrombosis Following Trauma or Unusual Effort, Ann. Int. Med. **40**: 327-339 (Feb.) 1954.

3. Boas, E. P.: Angina Pectoris and Cardiac Infarction from Trauma or Unusual Effort, with a Consideration of Certain Medicolegal Aspects, J. A. M. A. **112**: 1887-1892 (May 13) 1939.

4. Sprague, H. B.: The Effect of Trauma and Strain on the Production and Aggravation of Heart Disease, Bull. New York Acad. Med. **23**: 631-642 (Nov.) 1947.

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ORGANIZATION SECTION

STATEMENT BY DR. GEORGE F. LULL ON FLUORIDATION OF WATER

May 10, 1954

Honorable Charles A. Wolverton
Chairman, Committee on Interstate and
Foreign Commerce
House of Representatives
Washington, D. C.

Dear Sir:

I would like to take this opportunity, on behalf of the American Medical Association, to submit for your consideration the views of the American Medical Association concerning the fluoridation of drinking water, which we understand is included among those subjects currently being studied by your Committee and which will be the subject of hearings later this month.

The Councils on Pharmacy and Chemistry and Foods and Nutrition of the American Medical Association made a careful study of all available data with respect to the ingestion of fluorides in drinking water under natural conditions and when fluorides are added. On the basis of this study, the Councils on Pharmacy and Chemistry and Foods and Nutrition adopted the following statement on Nov. 2, 1951:

> "The Council on Pharmacy and Chemistry and the Council on Foods and Nutrition have been requested to state their opinion regarding the safety of fluoridation of water supplies, a procedure which has now been adopted by more than 140 cities.
>
> "The Councils are unaware of any evidence that fluoridation of community water supplies up to a concentration of one part per million would lead to structural changes in the bones or to an increase in the incidence of fractures. The only difficulty so far revealed is a possible increase in mottling of the tooth enamel. The available evidence based on thousands of observations indicates that the incidence of mottling of the enamel in children who drink water containing fluoride up to a concentration of one part in a million is minimal and detectable only by careful dental examination. It occurs only in a small percentage of children and is so slight as not to present a problem from the point of view of appearance or strength of the teeth. Evidence of toxicity other than the effect on enamel has not been reported in communities where the water supply has several times this concentration. After considering the evidence available at this time, the Councils believe that the use of drinking water containing up to one part per million of fluoride is safe. However, the use of products which are naturally high in fluoride content, such as bone meal tablets, or of lozenges, dentifrices, or chewing gum, to which fluoride has been added, should be avoided where the drinking water has been fluoridated. In places where children are subjected to warm temperatures and consequently drink large amounts of water, a lower concentration of fluoride may be necessary to avoid mottling of the teeth."

The Councils purposely refrained from making any recommendation that communities support or oppose projects for the fluoridation of water supplies. It was the opinion of the Councils that this question should be answered by the dental profession.

The House of Delegates of the American Medical Association at its meeting in Los Angeles, Calif., Dec. 4 to 7, 1951, adopted the following resolution:

> "WHEREAS, Carefully controlled studies have demonstrated that fluoridation of water supply has been definitely beneficial in the reduction of dental caries in the younger age group; and
>
> "WHEREAS, The Council on Pharmacy and Chemistry has supported that fluoride is nontoxic in community water supplies up to one part per million; and
>
> "WHEREAS, The addition of fluoride to community water supplies seems to have merit; therefore be it
>
> *"Resolved,* That the House of Delegates of the American Medical Association endorse the principle of fluoridation of community water supplies."

The House of Delegates of the Association went a step further than the Councils in endorsing the principle of fluoridation. Again, however, the House of Delegates did not urge or recommend that any communities undertake to fluoridate their water supplies.

In summary, then, the American Medical Association in 1951, through its Councils on Pharmacy and Chemistry and Foods and Nutrition and House of Delegates, reached the following conclusion with respect to fluoridation: Fluoridation of public water supplies in a concentration not exceeding one part per million is nontoxic and its principle is endorsed. The position of the Association has not changed since that time.

It is requested that this letter be made a part of the record of the hearings to be conducted by your Committee on this subject.

Sincerely,
GEORGE F. LULL, M.D.
Secretary and General Manager

MEDICAL SOCIETY OF DELAWARE

Although the Medical Society of Delaware is generally considered to have been founded on Feb. 3, 1789, when it was incorporated by legislative act as "The President and Fellows of the Medical Society of Delaware," there is evidence that a state medical society existed before that date. In his presidential address, delivered in 1947, Dr. W. Edwin Bird of Wilmington, present executive secretary of the society and editor of its journal, cites the work of Dr. Joseph M. Toner, who in 1873 tabulated the medical societies in the United States. Dr. Toner, a trustee of the Smithsonian Institution, who was President of the American Medical Association in 1873 and of the American Public Health Association in 1874, listed the Delaware State Medical Society as having been founded in 1776. It was more than 12 years later that the Medical Society of Delaware was incorporated by 27 physicians.

The first meeting of the society was held May 12, 1789. Although the original charter "only contemplated an association for the promotion of the unanimity and scientific and practical advancement of the profession of medicine in the State," the powers of the society were broadened by subsequent acts of the legislature, which conferred on the society the authority to appoint annually a body from their own number, to be called the Board of Medical Examiners, "with power to permit any applicant to practice medicine and surgery within the State, upon the presentation of a diploma conferred by a reputable college of medicine, or who otherwise submitted to a full, strict, and impartial examination by the Board and read a satisfactory thesis upon some medical subject." A penalty was imposed on anyone who practiced medicine in the state without proper authority from this board.

The annals of the society contain the names of many members who were prominent in civic and philanthropic affairs. According to Dr. Bird, "The first President of the 'Delaware State,' after the adoption of the state constitution in 1777, was the physician John McKinley, one of the original fellows, who served from February till September, 1777, when he was captured by the British at the Battle of the Brandywine and held prisoner till the end of the war. It is of further interest that the last president of the 'Delaware State' and first governor of the state of Delaware was Dr. Joshua Clayton, another original fellow, who governed from 1789 till 1792."

Among other illustrious names in the early history of the society are those of its first president, Dr. James Tilton, member of the Continental Congress and of the state house of representatives and first Surgeon General of the Army (1813-1815), for whom Tilton Hospital in Wilmington and the Tilton General Hospital at Fort Dix (World War II) were named; Dr. Arnold Naudain, the society's president, 1823-1824 and 1828-1829, member of the state legislature, speaker of the senate, and U. S. senator; Dr. James Couper, president of the state society from 1835 to 1841 and again from 1843 to 1845, who was Vice-President of the American Medical Association in 1863; Dr. Henry F. Askew, state society president, 1851-1855 and 1875-1876, postmaster of Wilmington, port physician, a founder of the Historical Society of Delaware, who was named Vice-President of the American Medical Association in 1859 and its President in 1867; and Dr. Gove Saulsbury, member and speaker of the state senate, and governor of Delaware, who served as president of the society, 1861-1862.

The society has a membership of 362, about 90% of the physicians in practice in Delaware, in three county societies: New Castle, Kent, and Sussex. Its headquarters are on the eighth

North American Building in Wilmington, which houses the headquarters of the Medical Society of Delaware.

floor of the North American Building in Wilmington. Officers for the current year are Drs. Hewitt W. Smith, Harrington, president; Lewis B. Flinn, Wilmington, president-elect; Glenn W. M. Van Valkenburgh, Georgetown, vice-president; Norman L. Cannon, Wilmington, secretary; Charles Levy, Wilmington, treasurer; and Dr. Bird, executive secretary. *The Journal of the Delaware State Medical Society,* which Dr. Bird has served as editor for 38 years, was established in 1909.

DR. ARESTAD ACCEPTS APPOINTMENT WITH MINE WORKERS FUND

Dr. Fritjof H. Arestad, associate secretary of the A. M. A. Council on Medical Education and Hospitals, has resigned in order to accept appointment with the Welfare and Retirement Fund of the United Mine Workers of America. Dr. Arestad will assume his duties as medical administrator of the Johnstown, Pa., area on July 1. He has been associated with the hospital work of the Council since 1928 and during his 25 years of service has engaged in activities related to the registration of hospitals, approval of internships and residencies, and the standardization of technical schools. His many friends at headquarters wish him abounding luck and success in his new post.

FEDERAL MEDICAL LEGISLATION

Oral Narcotic Prescriptions

Senator Long (D., La.) has introduced in S. 3447 an identical bill to that of Congressman Martin (R., Iowa), H. R. 9163. The latter bill replaces H. R. 7817, previously reported. The earlier measure had the active support of the American Medical Association. The present bills are supported by the National Association of Retail Druggists and the Federal Narcotics Commissioner Anslinger. These bills would permit the sale of narcotic drugs possessing relatively little or no addiction liability on oral prescription by a licensed practitioner. The prescription must be reduced promptly to writing and preserved by the dealer for two years. Under the earlier bill, the regulations, once issued, remained in effect unless changed by the courts. S. 3447 and H. R. 9163 have a "capturing clause" giving the commissioner of narcotics authority to rescind the regulations if abuse occurs. These measures were referred to the respective finance committees of the House and Senate.

Presumption of Service-Connection for Muscular Atrophy

Senator Humphrey (D., Minn.), in S. 3441, would establish a presumption of service-connection for progressive muscular atrophy developing a disability of 10% or more within three years after separation from the service. At the present time, there is no set period for presumption of service-connection for progressive muscular atrophy. This bill was referred to the Finance Committee.

Presumption of Service-Connection for Multiple Sclerosis and Psychoses

Congressman Radwan (R., N. Y.) has introduced a measure, H. R. 9169, which would increase the presumption of service-connection period for multiple sclerosis from two to three years, and would increase to three years the period of presumption for psychoses. The period of presumption for psychoses at present, is one year. However, for hospitalization and medical treatment including outpatient care, the period of presumption of service-connection is two years. H. R. 8789, also by Mr. Radwin, is identical with H. R. 9169 except that the former includes the lengthening of presumption of service-connection for arthritis from one year to three years and has been reported favorably by the Veterans Affairs Committee. H. R. 9169 was referred to the Veterans Affairs Committee.

Private Benefits Plans in Lieu of Social Security

Congressman Curtis (R., Mo.) proposes in H. R. 9068 to amend the Social Security Act to authorize the waiver of Old Age and Survivors Insurance tax payments for a covered individual provided the individual participated in an insurance retirement plan approved by the Secretary of the Treasury. This would allow the individual to set up his own retirement plan instead of participating in the one provided under the Social Security Act. Unlike the Jenkins-Keogh bill, this bill would not defer income tax on money put into the insurance-retirement plan. It was referred to the Ways and Means Committee.

Unlimited Earned Income at Sixty-Five

Congressman Fino (R., N. Y.) has proposed in H. R. 9108 to amend title 2 of the Social Security Act to allow an unlimited earned income without loss of retirement benefits under the Old Age and Survivors Insurance program at age 65 rather than at 75 as in the present law. This bill was referred to the Ways and Means Committee.

Public Assistance Amendment of Social Security Act

Congressman Holifield (D., Calif.), in H. R. 9135, would extend for an additional two years the amendments of 1952 to the Social Security Act, which revised the formula for federal grants to states for assistance to the blind aand disabled and aid to dependent children. Under the revised formula, the federal grants will remain $20 of the first $25 and one-half of the next $30 for old age assistance grants and assistance to the blind and disabled. The federal matching aid for dependent children would be continued at $12 of the first $15 for each dependent child and one-half of the next $15 for a single dependent child and one-half of the next $6 for each additional dependent child. This bill was referred to the Ways and Means Committee.

Prepared by the Washington Office of the American Medical Association.

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MEDICAL NEWS

GEORGIA

Memorials to Dr. Strickler.—To honor the memory of the late Dr. C. W. Strickler Sr., emeritus professor of clinical medicine, Emory University School of Medicine, a memorial scholarship has been established for the support of a medical student at that university. Donations to the C. W. Strickler Memorial Scholarship Fund may be made through the Emory University treasurer. Dr. John D. Martin is chairman of the scholarship committee. A new six-story doctors building, 1293 Peachtree St., which is to be completed by September, will be named the Cyrus W. Strickler Sr. Doctors Building. Dr. Strickler was affiliated with Emory University Hospital, Emory University, St. Joseph's Infirmary, and Grady Memorial Hospital, Atlanta.

IDAHO

State Medical Meeting at Sun Valley.—The 62nd annual meeting of the Idaho State Medical Association will be held at Sun Valley, June 13-15, under the presidency of Dr. E. Victor Simison of Pocatello. Guest speakers and their first presentations include:

Vincent J. O'Conor, Chicago, Pertinent Facts Concerning the Care of Urological Surgical Patients—Preoperative, Operative, and Postoperative.
Russell R. de Alvarez, Seattle, Hormone Therapy in the Female.
Francis L. Lederer, Chicago, Significance of Hoarseness.
Ovid O. Meyer, Madison, Wis., Problem of Nephritis.
Ottiwell W. Jones Jr., San Francisco, Traumatic Subdural Hematoma.

Guest speakers will also participate in the round-table session Wednesday afternoon in the opera house. Social events have been planned, including a barbecue Monday night at the Trail Creek Cabin and a banquet Wednesday in the lodge dining room. The Sun Valley Ice Carnival on Tuesday will follow the stag dinner for the men in the lodge dining room and the annual ladies dinner in the Continental Buffet Friday. Sports events include the golf tournament, a trap shoot, tennis, and fishing.

INDIANA

University News.—Dr. Fred M. Wilson, assistant professor of ophthalmology, Indiana University School of Medicine, Indianapolis, has been named chairman of the department to succeed Dr. Robert J. Masters, who is relinquishing the chairmanship he has held for the past 11 years to devote full time to private practice.

Industrial Education in Cancer.—The Marion County Cancer Society plans to begin an industrial education program within 32 local industries having 100 to 500 employees. Only educational materials already screened and approved by the cancer committee of the Indianapolis Medical Society will be used, and periodic reports on program progress will be furnished the committee.

IOWA

Society Issues Resources Handbook.—The committee on medical service, Iowa State Medical Society, has prepared "A Handbook of Resources Available to Physicians," which lists private agencies and mixed groupings; the Iowa state departments of health, social welfare, and public instruction; the state boards of education and control; separate state agencies; and local public health as well as federal agencies. The book, which is furnished to members of the state medical society, may be purchased through the office of the society, 529 36th St., Des Moines 12.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

KENTUCKY

Heart Surgery for the Indigent.—The Kentucky Heart Association is sponsoring a plan to provide free heart surgery to medically indigent Kentuckians, 16 years or older. Application may be made by any physician on behalf of such patients to the Heart Surgery Committee, Kentucky Heart Association, Columbia Building, 401 W. Main, Louisville 2.

Personal.—The American Diabetes Association has appointed Dr. Carlisle Morse, Louisville, as governor of the association for the state of Kentucky and as vice-chairman of the committee on detection and education of the ADA for the year 1954.—— Dr. Carl C. Howard, Glasgow, chairman, board of trustees, Kentucky Rural Medical Scholarship Fund, received an achievement citation for his outstanding work in medical rural service from Transylvania College, Lexington, at a Kentucky Day Dinner held in connection with the college's 175th anniversary celebration.

LOUISIANA

Society News.—At a recent meeting of the Louisiana Society of Anesthesiologists the following officers were elected: Dr. Frank L. Faust, New Orleans, president; Dr. Francis X. LeTard, New Orleans, vice-president; and Dr. Richard H. Morris, Rayville, secretary-treasurer.

Dr. Hull Named Associate Dean.—Dr. Edgar Hull, the only member of the original faculty of the Louisiana State University School of Medicine, New Orleans, who is still teaching, has been appointed associate dean. Dr. Hull, who was an instructor when the school of medicine was established in 1931, has been professor and head of the department of medicine since September, 1939, when he succeeded the late Dr. George S. Bel. Dr. Hull is co-author with Richard Ashman, Ph.D., professor emeritus, of "Essentials of Electrocardiography."

MAINE

State Medical Meeting in Rockland.—The Maine Medical Association will hold its 101st annual session at the Samoset, Rockland, June 13-15. Dr. Edward J. McCormick, Toledo, Ohio, President of the American Medical Association, will be guest speaker at the annual banquet Tuesday, 6:30 p. m. He will deliver his address "The Miracle of American Medicine" after the presidential address by Dr. Norman H. Nickerson, Greenville. The dinner speaker, Sunday, 6:30 p. m., will be Mr. Leonard E. Read, president of the Foundation for Economic Education, Inc., Irvington-On-Hudson, N. Y., who will have as his subject "Political Robin Hoodism and Its Cure." The Maine Heart Association will present a clinical program Monday morning, with Dr. Elton R. Blaisdell, Portland, vice-president, as chairman. At 11 a. m. Dr. Alton Goldbloom, Montreal, Canada, sponsored by the State of Maine Department of Maternal and Child Health, will talk on infant feeding. At 2 p. m. Dr. Richard B. Cattell, director, Lahey Clinic, Boston, will discuss "Surgical Management of Thyroid Diseases." Tuesday morning Dr. Theodore L. Badger, Boston, will deliver the address "Rest, Exercise and Chemotherapy in the Treatment of Tuberculosis" under the sponsorship of the Maine Tuberculosis Association, after which Dr. Donald Coulton, Bangor, will speak on controlled labor. Tuesday afternoon the Maine Medico-Legal Society will meet at 2 p. m. to hear remarks by Attorney-General Alexander A. LaFleur, president, Maine Medico-Legal Society, and Robert Marx, chief of State of Maine Police, and an address with pictures by Dr. Richard Ford, head of the medicolegal department, Harvard Medical School, Boston. A golf tournament has been arranged. The woman's auxiliary will hold its annual convention simultaneously. The Maine Trudeau Society will have its organization meeting at 2 p. m. Tuesday.

MARYLAND

Hospital News.—The board of directors of the Hospital for the Women of Maryland, Baltimore, has decided to close its 42-year-old school of nursing with the graduation of the class of 1954 and to offer instead a "refresher" course to nurses who have been out of active nursing for some time and wish to be brought up to date in order to resume the practice of their profession.

MASSACHUSETTS

Amherst Health Conference.—The annual meeting of the Amherst Health Conference will be held on the campus of the University of Massachusetts, Amherst, June 15-18. Public health movies will be shown. Physicians participating in the conference will include John D. Porterfield III, Columbus, Ohio, Samuel B. Kirkwood, Brookline, Alton S. Pope, A. Daniel Rubenstein, George E. Gardner, Geoffrey Edsall, Roy F. Feemster, and Hugh R. Leavell, Boston. Dr. Rubenstein will preside over the panel discussion "Educational Television and Public Health." A summary of the conference will be given by Charles E. A. Winslow, Dr.P.H., New Haven, Conn., at the conference luncheon.

Course on Electrical Activity of Nervous System.—In announcing a special summer program in bioelectric signals from Aug. 23 to Sept. 3 at the Massachusetts Institute of Technology, Cambridge, Ernest H. Huntress, Ph.D., director of the summer session, stated: "This field demonstrates unusually well the interplay between two previously distinct areas of professional interest, electrical engineering and neurophysiology, brought about by modern scientific and technical developments." He pointed out that, though the two week program is intended primarily for those who are or plan to become research workers in this field, others who seek to understand the findings and implications of such research will also find the course valuable. It will deal with electrical activity of the central nervous system, particularly evoked responses to sensory stimuli and brain-wave activity. Special lecturers will include:

Mary A. B. Brazier, Ph.D., neurophysiologist, Massachusetts General Hospital, Boston.
Frank Brink, Ph.D., associate professor of biophysics, Johns Hopkins University, Baltimore.
Ralph W. Gerard, professor of neurophysiology and physiology, University of Illinois College of Medicine, Chicago.
Stephen W. Kuffler, associate professor of physiological optics, Johns Hopkins University, Baltimore.
Putnam C. Lloyd, staff member, Rockefeller Institute for Medical Research, New York.
Karl H. Pribram, chairman, department of neurophysiology, Institute of Living, Hartford, Conn.

Registrations will be limited. Tuition will be $160. Academic credit will not be offered. Details may be obtained from the Summer Session Office, Room 7-103, M.I.T., Cambridge 39.

MICHIGAN

Gudakunst Memorial Lecture.—The fifth annual Don W. Gudakunst memorial lecture was delivered at the School of Public Health, Univerity of Michigan, Ann Arbor, May 5, by Dr. John R. Paul, Yale University School of Medicine, New Haven, Conn., whose topic was "Historical and Geographical Aspects of Poliomyelitis."

Society News.—The Upper Peninsula Medical Society will hold its 59th annual convention, June 18-19, at the Riverside Country Club, Menominee. The following physicians will participate in the program:

John A. Schindler, Monroe, Wis., Group Psychotherapy.
Adolph Sahs, Iowa City, Strokes, Differential Diagnosis.
Joseph W. Gale, Madison, Wis., What Surgery Has to Offer in Pulmonary Disease.
James P. Conway, Milwaukee, Prematurity.
Earle A. Irvin, Detroit, How to Handle Disabilities.
E. Richard Harrell Jr., Ann Arbor, Mich., Dermatoses of Interest to the General Practitioner.
Harry Beckman, Milwaukee, Pharmacologic Approach to Malignancy.

Mr. Harvey V. Higley, administrator of veterans affairs, Washington, D. C., will be the guest of honor.

Personal.—Dr. Roger J. Hanna, a former president of the Jackson County Medical Society, has been named medical director for all state tuberculosis hospitals in Texas. Dr. Hanna, who resides in Austin, Texas, was formerly medical director of the Jackson County Sanatorium and served as head of the tuberculosis hospital in Richmond. Ind.——Dr. Louis J. Hirschman, Traverse City, a former president of the Michigan State Medical Society, has been named chairman of the ninth annual Michigan Clinical Institute in March, 1955.

MONTANA

Society News.—The Cascade County Medical Society will sponsor its fifth annual Medical Surgical Conference at the Meadow Lark Country Club, Great Falls, June 14-15. Chairman of the program committee of the conference is Dr. John A. Layne, Great Falls.——The Montana Obstetrical and Gynecological Society at its annual meeting in Billings elected Dr. Harold W. Fuller, Great Falls, president; Dr. David Gregory, Glasgow, president-elect; Dr. Robert D. Knapp, Wolf Point, vice-president; and Dr. Leonard W. Brewer, Missoula, secretary-treasurer (reelected).——The Montana Medical Association announces that mail for the association's executive office should be addressed to its new Post Office Box 1692, Billings.——The Northcentral Montana Medical Society recently elected Dr. William E. Hadcock, Conrad, president; Dr. Robert K. West, Cut Bend, vice-president; and Dr. R. W. Poundstone, Shelby, secretary-treasurer.

NEW JERSEY

Neuropsychiatric Institute.—The New Jersey Neuro-Psychiatric Institute is functioning as a diagnostic treatment training and research center for various psychiatric and neurological disorders. A department of research has been established and an intensive training program undertaken. Patients eligible for admission are those with epilepsy who do not have a complicating psychosis or mental deficiency; juvenile psychotics; alcoholics; patients with neurological disorders, such as multiple sclerosis, amyotrophic lateral sclerosis, and cerebral palsy; drug addicts; and sex offenders.

Society News.—Newly elected officers of the New Jersey Neuropsychiatric Association include: Dr. Frank P. Pignataro, Red Bank, president; Dr. J. Lawrence Evans, Englewood, president-elect; Dr. Ira S. Ross, Newark, secretary; and Dr. Evelyn P. Ivey, Morristown, treasurer.——At the annual meeting of the New Jersey chapter, American College of Surgeons, Feb. 6, in Trenton, Dr. Paul M. Mecray, Camden, was elected president, Dr. Philip J. Kunderman, New Brunswick, vice-president, Dr. Benjamin Daversa, Spring Lake, secretary, and Dr. Charles A. Hoffman, Plainfield, treasurer. The Annual Surgical prize was awarded to the authors of the paper "Appendices Epiploicae: Clinical and Pathological Considerations," Drs. Stanley S. Fieber and Jerome Forman of the Veterans Administration Hospital, East Orange. The chapter offers yearly $100 prizes for the best paper on a surgical topic published by a resident and the best unpublished paper by an intern of a New Jersey hospital.

NEW YORK

New Psychiatric Clinic Directory.—The New York State Mental Health Commission has compiled the second edition of the directory of public and voluntary psychiatric clinics in New York State. Its descriptive material covers the period from June to November, 1953. It includes the names of chief personnel for each clinic and outline regional maps showing the location of psychiatric clinic facilities. For information, address the New York State Department of Mental Hygiene, Albany, N. Y.

Hearing on International Water Control.—Dr. Herman E. Hilleboe, Albany, state health commissioner and chairman of the Water Pollution Control Board, announces that a public hearing to consider revised proposals for the official classification of all International Boundary Waters, as defined by treaty between the United States and Canada, within the Lake Erie-Niagara River drainage basin, will be held at 8 p. m., June 30, in the Buffalo Museum of Science. It is proposed to establish a "Class A-Special (International Boundary Waters)" for assignment to all the waters of Niagara River. This classification is fully consistent and compatible with the objectives of the International Joint Commission.

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New York City

Personal.—Dr. Perrin H. Long, professor and chairman of the department of internal medicine, State University of New York College of Medicine at Brooklyn, has been promoted to brigadier general, Medical Corps, United States Army Reserve. Since World War II Dr. Long has been active in Medical Reserve Corps activities, currently as the Commanding Officer of the Headquarters 818th Hospital Center, United States Army Reserve, New York City.——Dr. Edgar M. Medlar, chief pathologist for the division of tuberculosis, New York State Department of Health, has been awarded the Trudeau medal of the National Tuberculosis Association given annually in recognition of "the most meritorious contribution on the cause, prevention or treatment of tuberculosis."

Care of Alcoholics.—According to the 1953 report of the Committee on Alcoholism of the Welfare and Health Council, medical, psychiatric, and social service facilities for the treatment of alcoholics in New York City are "grossly inadequate." The report points out that "alcoholism is an active factor in the lives of 200,000 residents in this city," and "accounts for losses in wages, medical costs and lost production amounting to more than $200,000,000 a year." It is stated in the report that further exploration in the following areas is required: (1) development of more precise and generally accepted terminology in relation to the disease of alcoholism and an acceptable system of medical reporting of cases treated by physicians; (2) encouragement of hospital-connected medical schools to establish inpatient and outpatient clinics with or without state aid and the reestablishment of an alcoholic ward at Bellevue Hospital; (3) development of more effective instruction in public, private, and parochial schools for the prevention of alcoholism; (4) encouragement of the newly elected city administration to accept responsibility for supporting remedial measures in the Welfare Department, the Magistrates' Court, and the Department of Hospitals; (5) establishment of commitment procedures of a civil or quasi-civil nature along the lines recently enacted in other states; and (6) inducement of the several health insurance plans to accept alcoholism as an insurable risk.

OHIO

Premedical Training.—Oberlin College has initiated a project, to be known as the Study of Preparation for Medical Education in a Liberal Arts College, which is being supported by a grant of $5,500 from the Commonwealth Fund in New York City. A four-man research team will hold interviews and conferences at 25 medical schools at which Oberlin graduates have studied in the past decade. The team will also: (1) explore undergraduate curricular problems in relation to medical school requirements; (2) investigate methods of improving liaison between medical schools and undergraduate colleges; and (3) give special attention to any studies the individual medical schools have made of the relation of undergraduate programs to success in medical schools. Initial work on the study has already begun, but the field work will not be completed until the summer of 1955. Later a report of the study, believed to be the first of its kind ever undertaken in this field, will be published.

PENNSYLVANIA

Posthumous Award.—The National Tuberculosis Association at its golden anniversary meeting in Atlantic City awarded the Will Ross medal posthumously to the late Leigh Mitchell Hodges, Doylestown, former newspaper columnist who died April 4. Through his promotion of the first Christmas seal sale in this country in 1907, Mr. Hodges established the Christmas seal as the fund-raising technique through which about $335,400,000 has been raised in the past 46 years to support the tuberculosis control programs of the voluntary tuberculosis associations throughout the country.

Dr. Allbritten Goes to Kansas University.—Dr. Frank F. Allbritten Jr., associate professor of surgery, Jefferson Medical College of Philadelphia, has been appointed professor of surgery and chairman of the department at the University of Kansas School of Medicine, Kansas City. He succeeds Dr. Paul W. Schafer, who has resigned to enter military service. Dr. Allbritten is surgical director at the Barton Memorial division of the Jefferson Medical College Hospital, consultant in thoracic surgery to the Valley Forge Army Hospital, Phoenixville, consultant in cardiovascular surgery, Philadelphia Naval Hospital, and consultant in thoracic surgery, Veterans Administration Hospital, Philadelphia.

Philadelphia

Personal.—Dr. L. Kraeer Ferguson, professor of surgery, Woman's Medical College of Pennsylvania, was recently guest lecturer at the Medical School of the University of the Dominican Republic on the subject "Significance of Polypi in the Colon."

Death of W. D. Wilcox.—Wayland Delano Wilcox, Ph.D., since 1915 editor and manager of the college department of Lea & Febiger, Publishers, died of a heart attack, March 9 at the age of 78. Mr. Wilcox, who was born in Coventry, R. I., was educated at Alfred University, Alfred, N. Y., Lewis Institute, Chicago, and at the University of Chicago.

TEXAS

Dr. Holle Named State Health Officer.—Dr. Henry A. Holle, regional medical director since 1948 for region 2 (New York) of the Department of Health, Education, and Welfare, took office as state health officer of Texas on May 1. Dr. Holle, a native of Brenham, has been a career officer of the Public Health Service since 1934 and has served in numerous posts in this country and abroad. He has been released on leave of absence from the service to take the Texas assignment.

Society News.—At a recent convention of the Texas Academy of Internal Medicine the following officers were elected: Dr. Martin S. Buehler, Dallas, president; Dr. Robert A. Hettig, Houston, vice-president; and Dr. George M. Jones, Dallas, treasurer.——At the annual meeting of the Texas Society of Pathologists, Jan. 31 in Galveston, the following officers were installed at a banquet at the Galvez Hotel: Drs. John J. Andujar, Fort Worth, president; Charles B. Sanders, Houston, president-elect; A. James Gill, Dallas, vice-president; and Lloyd R. Hershberger, San Angelo, secretary.

UTAH

Society News.—At a recent meeting of the Central Utah Medical Society, Dr. G. Stanford Rees, Gunnison, was elected president; Dr. John B. Cluff, Richfield, vice-president; and Dr. Kurt L. Jenkins, Marysvale, secretary-treasurer.

State Association Honors Journalist.—The Utah State Medical Association has bestowed an award of merit on William C. Patrick, who as medical editor of the *Salt Lake Tribune* has chronicled the achievements of the medical profession for nearly a decade. At a banquet at the Alta Club in Salt Lake City, April 29, Dr. Frank K. Bartlett, Ogden, president of the association, presented a plaque to the veteran newsman, one of the earliest to recognize the value to the community of accurate medical news told in layman's language.

WASHINGTON

Course on Cardiology.—A course on recent advances in cardiology will be presented at the University of Washington School of Medicine, Seattle, June 14-15, for practicing physicians, internists, pediatricians, and surgeons. Discussions and conferences will be illustrated and supplemented with heart models, high fidelity tape recordings, and audiovisual teaching aids. There will be panel discussions on treatment of rheumatic fever and subacute bacterial endocarditis, treatment of the hypertensive patient, and treatment of structural and degenerative diseases of the heart. Dr. Charles T. Dotter, professor of radiology, University of Oregon Medical School, Portland, will be guest lecturer. Co-sponsors of the course are the University of Washington School of Medicine, Washington State Medical Association, and Washington State Department of Health. Tuition is $20.

WEST VIRGINIA

Society News.—The Preston County Medical Society has scheduled an all-day meeting June 17 at the Kingwood Country Club in the Cheat River Valley, about four miles east of Kingwood, near State Route 7. At the banquet, addresses will be presented by Dr. Edgar W. Davis, Washington, D. C., professor of thoracic surgery, Georgtown University School of Medicine, who will discuss "The Latest in Cardiovascular Surgery," and Dr. Leo H. Criep, Pittsburgh, associate professor of medicine at the University of Pittsburgh School of Medicine, who will have as his subject "Allergic Pulmonary Disease." A golf tournament has been arranged, and a trap shooting range and fishing will be available. A general invitation has been extended by the Preston County Medical Society to all members of the West Virginia State Medical Association to attend the meeting.

Golden Anniversary of Society.—The fifth annual postgraduate session, sponsored by the Barbour-Randolph-Tucker Medical Society, June 17, at the Tygart Valley Country Club near Elkins, will celebrate the 50th anniversary of the founding of the society, March 25, 1904. The morning will be devoted to golf. The following addresses, each followed by a question and answer period, will be presented during the afternoon:

Surgery of the Large Bowel, A. Stephens Graham, Richmond, Va.
Disorders of the Female Breast—Some New Developments in Diagnosis and Prognosis, Helen Ingleby, Philadelphia.
Growth Failure, Stuart S. Stevenson, Pittsburgh.
Recent Advances in Drug Therapy, John C. Krantz Jr., Ph.D., Baltimore.

Kloman Instrument Company, Inc., of Charleston, will be host at a social hour after the scientific program. Dr. Theodore G. Klumpp, New York, president of Winthrop-Stearns, Inc., guest speaker at the banquet, will have as his subject "A New Look at the Old Ticker." The society has extended a cordial invitation to all members of the West Virginia State Medical Association to attend the meeting. Dr. James L. Cunningham, Pickens, W. Va., who will be 91 years old in September, the only living charter member of the society, will be an honor guest at the meeting. Dr. Cunningham is still engaged in general practice in his home community.

GENERAL

Meeting on Angiology.—The North American chapter of the International Society of Angiology will hold its second scientific meeting June 19 at the Hotel Mark Hopkins, San Francisco. Dr. Robert R. Linton, Boston, will serve as moderator for a panel discussion "The Present Status of Tests for Peripheral Arterial Insufficiency," with Drs. George D. Lilly, Miami, Fla., Ormand C. Julian, Chicago, and Travis Winsor, Los Angeles, as collaborators. The afternoon session will be opened by Dr. Geza DeTakats, Chicago, who will deliver the presidential address "Revascularization of the Ischemic Extremity." Cocktails at 6:30 p. m. will precede the dinner for members and guests. The scientific program is open to the medical profession.

American Gastroenterological Association.—The 55th annual meeting of the American Gastroenterological Association will be held at the Hotel Mark Hopkins, San Francisco, June 18-19, under the presidency of Dr. Julian M. Ruffin, Durham, N. C. A. D. Hardy, Washington, D. C., director, Commission on Enteric Infections, has been invited to discuss those infections Friday afternoon. The Friday session will end with a clinical pathological conference conducted by Dr. Albert M. Snell, Palo Alto, Calif. Twenty-nine presentations will be made, the last one being "A Test for Coagulability of the Blood in Carcinoma of the Pancreas" by Drs. William J. Pierce (by invitation), Bernard D. Rosenak, and Rollin H. Moser, Indianapolis.

Tuberculosis Physicians Meet.—The American Academy of Tuberculosis Physicians will hold its annual meeting at the Palace Hotel, San Francisco, June 19. Dr. Ethan Allan Brown, Boston, will deliver the presidential address, "The Effects of Medical Treatment of Pulmonary Tuberculosis," at the luncheon, after the presentation of "Chronic Pulmonary Emphysema, Physiopathology and Treatment" by Dr. Maurice S. Segal, Boston, guest speaker. The meeting will open at 9 a. m. with discussion of "Leucocytic Defenses Against Tuberculosis—A New Method of Study in Man" by Dr. John W. Rebuck, Detroit, and will close with the presentation, at 4:40 p. m., of "A New Method of Diagnostic Testing and Administration of Drugs and Therapies," by Dr. Harry J. Corper, Denver.

American Society for the Study of Sterility.—The 10th annual meeting of the American Society for the Study of Sterility will convene at the St. Francis Hotel, San Francisco, June 18-20, under the presidency of Dr. Benjamin B. Weinstein, New Orleans. Topics for discussion include "General Problems in Fertility and Sterility," "Studies in Fertility and Sterility from the Point of View of the Veterinarian and the Biologist," "Semen and Testicular Studies," "The Role of the Cervix in Fertility and Sterility," and operative procedures for the relief of infertility in the female and in the male. Saturday afternoon will be devoted to panel discussion on tuboplasty, female sterility, and rebound phenomenon. Sunday afternoon, research problems and laboratory procedures will be considered. The banquet will be held Saturday at 8 p. m.

Society for Investigative Dermatology.—The 15th annual meeting of the Society for Investigative Dermatology will be held at The Clift, San Francisco, June 19-20. The scientific sessions will open Saturday with the presidential address "The Chronicle of the Society for Investigative Dermatology" by Dr. Arthur C. Curtis, Ann Arbor, Mich. Single-author presentations include:

Histodynamics of Human Scalp Hair, Albert M. Kligman, Philadelphia.
Cholinesterases in Human Skin, Olev R. Aavik, Chicago.
Comparison of pH in Sweat Produced by Heat and by Pharmacodynamic Stimulation, Franz J. Herrmann, New York.
Sweat Function in Psoriasis, Raymond R. Suskind, Cincinnati.
Selective Affinity of Elastic Tissue for Anionic Detergents, Richard B. Stoughton, Chicago.
Study of Several Factors Influencing Contact Irritation and Sensitization, Evelyn M. Rockwell, Cincinnati.

A cocktail party and dinner are scheduled for 7 p. m. Saturday.

American Ophthalmological Society.—The American Ophthalmological Society will hold its 90th annual meeting June 16-18 at Many Glacier Hotel, Glacier Park, Mont., under the presidency of Dr. William L. Benedict, Rochester, Minn. The following single-author presentations will be made:

Congenital Alacrimia in Familial Autonomic Dysfunction, John H. Dunnington, New York.
Harada's Disease Treated with Cortisone: Report of a Case, Frederick C. Cordes, San Francisco.
Medullated Corneal Nerves and Plexiform Neuroma Associated with Pheochromocytoma, Alson E. Braley, Iowa City, Iowa.
Hemifacial Spasm, James N. Greear Jr., Reno, Nev.
Fluidexchange in the Successfully Cyclodialyzed Eye, Peter C. Kronfeld, Chicago.
Role of Developmental Anomalies in Verticle Muscle Defects, Walter H. Fink, Minneapolis.
Multiple Malignant Melanomata of the Iris: A Case Report, G. Victor Simpson, Washington, D. C.
Pathologic Physiology of Intermittent Exotropia: A Clinical Study, Hendrie W. Grant, St. Paul.

American College of Chest Physicians.—The American College of Chest Physicians will hold its 20th annual meeting at the Fairmont Hotel, San Francisco, June 17-20, under the presidency of Dr. Alvis E. Greer, Houston, Texas. The following seminars on diseases of the chest, which will be presented Wednesday, are open to all physicians: Cancer of the Lung; Infectious Diseases of the Chest; Cardiopulmonary Function and Cardiography; and Surgical Treatment of Heart Disease. On Thursday the Jacob Jesse Singer testimonial dinner (6 p. m.), sponsored by the California chapter, American College of Chest Physicians, will be followed by the opening scientific session at 8 p. m. The first Jacob Jesse Singer lecture, "Remarks on the Etiology of Bronchogenic Carcinoma," will be delivered by Dr. Evarts A. Graham, St. Louis, and will be followed by a panel on research problems.

Neurologists Meet in Atlantic City.—The annual meeting of the American Neurological Association will be held at the Hotel Claridge, Atlantic City, N. J., June 14-16. The presidential address by Dr. Roland P. Mackay, Chicago, at 9 a. m., will be followed by "Further Evidence for a Frontal Lobe Component in Human Biological Intelligence" by Ward C. Halstead, Ph.D., Chicago, and Gerald Shure, B.S., Salt Lake City. During the Monday evening session in Trimble Hall, there will be a U. S. Navy photographic report on the use of electroencephalog-

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raphy in the management of acute combat head injury. A hitherto unclassified muscular disorder will be described Tuesday morning by Drs. Hans H. Reese and John W. Harman, Madison, Wis. The Tuesday afternoon session will begin with a review of recent evidence of the role of pyridoxin in human nutrition by Drs. George D. Gammon and Geraldine A. King, Philadelphia. The annual dinner for members and guests will be held at the Hotel Claridge at 7 p. m. Tuesday.

Meeting on Geriatrics.—The annual meeting of the American Geriatrics Society will be held at the Hotel Fairmont, San Francisco, June 17-19. The following panel discussions have been scheduled: "Recent Developments in Cardiology" (Dr. George C. Griffith, Los Angeles, moderator); "Methods of Determining Operability in Older Patients" (Dr. Warren H. Cole, Chicago, moderator); "Changes in Steroid Excretion with Advancing Years" (Dr. Cornelius P. Rhoads, New York, moderator); and "The Relation of Industry to Geriatrics" (Dr. Carl M. Peterson, Chicago, moderator). Cocktails at 7 p. m. (sponsored by the Schering Corporation) will precede the annual dinner (formal dress optional), for which Dr. Norris J. Heckel, Chicago, will serve as toastmaster. Dr. Salvatore P. Lucia, professor of medicine, University of California Medical School, San Francisco, will give an address, entitled "Balm for the Autumnal Years." Dinner, including gratuities, $10.

The Endocrine Society.—The annual meeting of the Endocrine Society will be held in the Sir Francis Drake Hotel, San Francisco, June 17-19, under the presidency of Earl T. Engle, Ph.D., New York. Topics to be discussed include gonads, gonadal hormones, and gonadotropins; thyroid, thyroid hormones, and thyrotropin; parathyroid, pituitary, and growth hormones; and adrenals, adrenal hormones, and adrenocorticotropins. Saturday afternoon will be devoted to a joint session with the American Diabetes Association, during which presentations will be made on hypophysectomy in patients with malignant diabetic vascular disease, increased insulin sensitivity in rats with hypothalamic lesions, effects of growth hormone on the structure and function of the islets of Langerhans, metabolic adjustments during stress, the effect of intravenous glucose on pyruvate during hydrocortisone (compound F) infusion, and ketogenic activity of corticotropin in the rat. Cocktails, sponsored by the donors of the awards of the society (Ayerst, McKenna and Harrison fellowship, Ciba award, and Schering fellowship) will precede the annual dinner, 7:30 p. m., at which the awards will be presented and Dr. Engle will deliver the presidential address.

Meeting of American Diabetes Association.—The annual meeting of the American Diabetes Association will convene at the Fairmont Hotel, San Francisco, June 19-20. Saturday afternoon will be devoted to a joint meeting with the Endocrine Society, when the Banting memorial lecture, "Hormones of the Pituitary Posterior Lobe," will be delivered by Sir Henry Dale, O.M., G.B.E., M.D., F.R.S., F.R.C.P., chairman of trustees, the Wellcome Trust, London, England, who was formerly director of the National Institute for Medical Research. The Banting medal will be presented to Dr. Dale at the banquet Saturday, 7:15 p. m., after which he will discuss "The Changing Outlook in Medicine." The presidential address will be delivered at the banquet by Dr. Randall G. Sprague, Rochester, Minn. A clinical-pathological conference will be presented Sunday from noon to 1 p. m. by Dr. Peter H. Forsham, Boston, and Dr. James F. Rinehart (by invitation), University of California Medical School, San Francisco. The scientific sessions will end Sunday with a panel discussion "Diabetes and Pregnancy," for which Dr. Garfield G. Duncan, Philadelphia, will serve as moderator. Collaborators include Drs. Lester J. Palmer, Seattle, Priscilla White, Boston, and, by invitation, Drs. M. Edward Davis, Chicago, and E. Stewart Taylor, Denver.

Meeting on Rheumatism.—The annual meeting of the American Rheumatism Association will be held June 18-19 at the Hotel St. Francis, San Francisco, under the presidency of Dr. Charles A. Ragan, New York. Thomas F. Dougherty, Ph.D., Salt Lake City, will present the opening address "Observations of the Antiphlogistic Influence of Adrenocortical Steroids." Dr. Richard H. Freyberg, New York, will serve as moderator for the panel discussion on hormones in rheumatic diseases preceding the luncheon (National Agencies and Arthritis Research) at 12:30 p. m. The presidential address at 2:15 p. m. will be followed by "American Rheumatism Association Cooperative Study of Cortisone Therapy in Rheumatoid Arthritis," an interim report, that will be presented, by invitation, by Dr. Currier McEwen, New York, for the committee and "A Comparison of Cortisone and Aspirin as a Suppressive Agent in Early Cases of Rheumatoid Arthritis," an invited presentation of the interval report of the British Medical Research Council, Nuffield Foundation, that will be given by Dr. Harry F. West, Sheffield, England. At 9 a. m. Saturday the association will hold a meeting in conjunction with the American Council on Rheumatic Fever and Congenital Heart Disease. The invited presentation, "A Physico-Chemical Investigation of Synovial Fluid" by Dr. Ernest Fletcher, London, England, will precede luncheon at 12:30 p. m. Dr. Edward W. Lowman, New York, will serve as moderator for a panel discussion on rehabilitation of the arthritic patient at 2 p. m.

PHILIPPINE ISLANDS

Dr. Wade Honored.—Dr. Herbert Windsor Wade, who has been medical director of the Leonard Wood Memorial for the Eradication of Leprosy, Culion Leper Colony, Palawan, since 1931, was honored in Madrid, Spain, where he attended the International Congress of Leprosy and served as its vice-chairman. He was one of three men elected to the Academica Nacional de Medicina and for the third time was named president of the International Leprosy Association, having served in this capacity since 1946. Dr. Wade, who was formerly affiliated with the McGill University Faculty of Medicine, Montreal, Canada, and with Tulane University of Louisiana Medical School and Charity Hospital in New Orleans, served as pathologist and bacteriologist of the Bureau of Science in Manila from 1916 to 1918 and as professor of pathology and bacteriology at the University of the Philippines from 1918 to 1922. At the Culion Leper Colony he was chief pathologist, 1922-1931, and acting chief physician, 1922-1924. He remained at his post at Culion during the entire period of Japanese occupation of the Philippines and was "liberated" when our troops returned to the islands. Dr. Wade served as U. S. delegate to the International Leprosy Conference in Cairo, Egypt, in 1938 and in Havana, Cuba, in 1948. Dr. Wade is the author (with J. N. Rodriguez) of "A Description of Leprosy" and is editor of the *International Journal of Leprosy*. He is a past president of the Manila Medical Society and the Culion Medical Society.

LATIN AMERICA

Cancer Congress.—The sixth International Cancer Congress, organized by the International Union Against Cancer, will be held in São Paulo, Brazil, July 23-29, with headquarters at Rua José Getulio, 211. The following symposiums have been scheduled:

Difference Between Benign and Malignant Lesions.
Nutrition and Cancer.
Carcinogenesis.
Classification, Diagnosis, and Treatment of Leukemias.
Chemotherapy of Cancer.
Radioactive Isotopes in Cancer Research.
Treatment of Pharyngeal Cancer.
Treatment of Cancer of the Mouth.
Teaching of Cancerology.
Cancer Detection.
Industrial Aspects of Cancer.
Geographic Pathology of Cancer.
Nomenclature of Tumors.

There will be panel discussions on mechanism of production of metastases, surgical treatment of gastric cancer, high energy irradiations in the treatment of cancer, therapy in cancer of the uterine cervix, and the problem of the patient with advanced cancer. Presentations by 28 physicians from the United States have been scheduled.

CORRECTION

Streptococcic Pharyngitis.—In the article on this subject in THE JOURNAL, May 8, 1954, page 109, micrococcic was incorrectly used throughout in referring to the infections concerned. These infections should have been referred to simply as streptococcic.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Held in approved medical schools where there are five or more candidates. Dates: June 22-23; Sept. 7-8 (Part I only). Candidates may file examinations at any time but the National Board must receive them at least six weeks before the date of the examination they wish to take. New candidates should apply by formal registration; registered candidates should notify the board by letter. Sec., Dr. John P. Hubbard, 133 S. 36th St., Philadelphia 4.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 22-24, 1954. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery.

CALIFORNIA: *Written.* San Francisco, June 21-24; San Diego, Aug. 23-26; Sacramento, Oct. 18-21. *Oral.* San Francisco, June 19; San Diego, Aug. 21; Los Angeles, Nov. 20. *Oral and Clinical Examination for Foreign Medical School Graduates.* Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

CONNECTICUT:* *Regular. Examination.* Hartford, July 13-14. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, July 13-14. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Examination.* Dover, July 13-15. *Reciprocity.* Dover, July 22. Sec., Dr. J. S. McDaniel, 229 South State St., Dover.

FLORIDA:* *Examination.* Jacksonville, June 27-29. Sec., Dr. Homer L. Pearson, 901 N.W. 17th St., Miami.

GEORGIA: *Examination and Reciprocity.* Atlanta and Augusta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Director of Medical Services, Guam Memorial Hospital, Agana.

HAWAII: *Examination.* Honolulu, July 12-15. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: *Examination and Endorsement.* Boise, July 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

ILLINOIS: *Examination and Reciprocity.* Chicago, June 22-24, and Oct. 5-7. Supt. of Registration, Mr. Frederic B. Selcke, Capitol Bldg., Springfield.

MAINE: *Examination and Endorsement.* Augusta, July 13-14. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: *Examination.* Boston, July 13-16. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston.

MICHIGAN:* *Examination.* Detroit and Ann Arbor, June 1954. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing 8.

MISSISSIPPI: *Examination and Reciprocity.* Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Old Capitol, Jackson 113.

NEBRASKA:* *Examination.* Omaha, June 1954. Director, Mr. Husted K. Watson, 1009 State Capitol Bldg., Lincoln.

NEVADA:* *Examination and Endorsement.* Reno, July 6. Sec., Dr. George H. Ross, 112 North Curry St., Carson City.

NEW HAMPSHIRE: *Examination and Reciprocity.* Concord, Sept. 8-9. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW YORK: *Examination.* Albany, New York, Syracuse and Buffalo, June 29-July 2. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany 7.

NORTH CAROLINA: *Examination.* Raleigh, June 21-24. *Endorsement.* Pinehurst, May 3; Raleigh, June 22. Sec., Dr. Joseph J. Combs, 716 Professional Bldg., Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, July 7-9. *Reciprocity.* Grand Forks, July 10. Sec., Dr. C. J. Glaspel, Grafton.

OREGON:* *Examination.* Portland, July 8-9. *Reciprocity.* Portland, July 9-10. Ex. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, July 13-15. Acting Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

SOUTH DAKOTA:* *Examination.* Vermillion, July 20-21. Reciprocity can be obtained at any time between meetings of board. Executive Secretary, Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

TEXAS: *Examination and Reciprocity.* Fort Worth, June 21-23. Rec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Ft. Worth 2.

UTAH: *Examination.* Salt Lake City, July 7-9. Final date for filing application is June 15. *Reciprocity.* Salt Lake City, June 15. Director, Mr. Frank E. Lees, Department of Business Regulation, 314 State Capitol, Salt Lake City.

WASHINGTON: *Examination.* Seattle, July 12-14. *Reciprocity.* Seattle, July 11. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

ALASKA:* On application. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

HAWAII. *Examination.* Honolulu, July 12-15. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

PUERTO RICO: *Examination.* San Juan, Sept. 7-11. Sec., Dr. Joaquin Mercado Cruz, Box 9156, Santurce.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

FLORIDA: *Examination.* Gainesville, June. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

NEW MEXICO: *Examination.* Santa Fe, July 18. Sec., Mrs. Marguerite Cantrell, P. O. Box 1522, Santa Fe.

OREGON: *Examination.* Portland, Sept. 11 and Dec. 4. Sec., Mr. Charles D. Byrne, State Board of Higher Education, Eugene.

WASHINGTON: *Examination.* Seattle, July 7-8. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

WISCONSIN: *Examination.* Milwaukee, Madison, Sept. 24, Dr. W. H. Barber, 621 Ransom St., Ripon.

*Basic Science Certificate required.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1954 Annual Meeting, San Francisco, June 21-25.

1954 Clinical Meeting, Miami, Florida, Nov. 29-Dec. 2.

1955 Annual Meeting, Atlantic City, N. J., June 6-10.

1955 Clinical Meeting, Boston, Nov. 29-Dec. 2.

1956 Annual Meeting, Chicago, June 11-15.

AMERICAN ACADEMY OF TUBERCULOSIS PHYSICIANS, San Francisco, June 19. Dr. Oscar S. Levin, P. O. Box 7011, Denver 6, Secretary.

AMERICAN COLLEGE OF CHEST PHYSICIANS, Fairmont Hotel, San Francisco, June 17-20. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Executive Director.

AMERICAN DIABETES ASSOCIATION, Fairmont Hotel, San Francisco, June 19-20. Dr. John A. Reed, 1 East 45th St., New York 17, Secretary.

AMERICAN GASTRO-ENTEROLOGICAL ASSOCIATION, San Francisco, June 18-19. Dr. H. Marvin Pollard, University Hospital, Ann Arbor, Mich., Secretary.

AMERICAN GASTROSCOPIC SOCIETY, Mark Hopkins Hotel, San Francisco, June 20. Dr. John Tilden Howard, 12 East Eager St., Baltimore 2, Secretary.

AMERICAN GERIATRICS SOCIETY, Hotel Fairmont, San Francisco, June 17-19. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

AMERICAN MEDICAL WOMEN'S ASSOCIATION, St. Francis Hotel, San Francisco, June 18-20. Dr. Charna G. Perry, 691 Bridgeway Blvd., Sausalito, Calif., Secretary.

AMERICAN NEUROLOGICAL ASSOCIATION, Hotel Claridge, Atlantic City, N. J., June 14-16. Dr. H. Houston Merritt, 710 West 168th St., New York 32, Secretary.

AMERICAN OPHTHALMOLOGICAL SOCIETY, Many Glacier Hotel, Glacier Park, Mont., June 16-18. Dr. Maynard C. Wheeler, 30 West 59th St., New York 19, Secretary.

AMERICAN RHEUMATISM ASSOCIATION, St. Francis Hotel, San Francisco, June 18-19. Dr. William H. Kammerer, 33 East 61st Street, New York 21, Secretary.

AMERICAN SOCIETY FOR THE STUDY OF STERILITY, St. Francis Hotel, San Francisco, June 18-20. Dr. Herbert H. Thomas, 920 South 19th St., Birmingham, Ala., Secretary.

CONFERENCE OF PRESIDENTS AND OTHER OFFICERS OF STATE MEDICAL ASSOCIATIONS, The Palace, San Francisco, June 20. Mr. Theodore Wiprud, 1718 M St. N.W., Washington 6, D. C., Secretary.

IDAHO STATE MEDICAL ASSOCIATION, Sun Valley, June 13-16. Dr. Robert S. McKean, 364 Sonna Bldg., Boise, Secretary.

MAINE MEDICAL ASSOCIATION, The Samoset, Rockland, June 13-15. Mr. W. Mayo Payson, 142 High St., Portland 3, Executive Secretary.

MEDICAL LIBRARY ASSOCIATION, Statler Hotel, Washington, D. C., June 15-18. Miss Audrey L. Kargus, St. Louis Medical Society, 3839 Lindell Blvd., St. Louis 8, Secretary.

MEDICAL SURGICAL CONFERENCE, Meadow Lark Country Club, Great Falls, Mont., June 14-15. Dr. John A. Layne, Box 911, Great Falls, Mont., Chairman.

NEUROSURGICAL SOCIETY OF AMERICA, Grand Hotel, Mackinac Island, Mich., July 21-24. Dr. Lester A. Mount, 700 West 168th St., New York 32, Secretary.

REGIONAL MEETINGS, AMERICAN COLLEGE OF PHYSICIANS:
NORTHERN CALIFORNIA AND NEVADA, San Francisco, June 16. Dr. Stacy R. Mettier, University of California Hospital, San Francisco 22, Governor.

SOCIETY OF BIOLOGICAL PSYCHIATRY, Claridge Hotel, Atlantic City, N. J., June 13. Dr. George N. Thompson, 2010 Wilshire Blvd., Los Angeles 5, Secretary.

SOCIETY FOR INVESTIGATIVE DERMATOLOGY, Clift Hotel, San Francisco, June 19-20. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

SOCIETY FOR VASCULAR SURGERY, Mark Hopkins Hotel, San Francisco, June 20. Dr. George D. Lilly, 333 Ingraham Bldg., Miami 32, Fla., Secretary.

THE ENDOCRINE SOCIETY, Sir Francis Drake Hotel, San Francisco, June 17-19. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City 3, Secretary.

FOREIGN AND INTERNATIONAL

BRITISH MEDICAL ASSOCIATION, Glasgow, Scotland, July 1-9, 1954. Dr. A. Macrae, B.M.A. House, Tavistock Square, London, W.C.1, England, Secretary.

CANADIAN MEDICAL ASSOCIATION, Vancouver, B. C., Canada, June 14-18, 1954. Dr. T. C. Routley, 244 St. George St., Toronto 5. Ontario, Canada, General Secretary.

CONFERENCE OF INTERNATIONAL UNION AGAINST TUBERCULOSIS, Madrid, Spain, Sept. 26-Oct. 2, 1954. Secretariat, Escuela de Tisiologia, Ciudad Universitaria, Madrid, Spain.

CONGRESS OF INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS, New York, N. Y., U. S. A., Sept. 12-17, 1954. Professor Franceschetti, 2 Avenue Mirmot, Geneva, Switzerland, Secretary-General.

CONGRESS OF INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY, Vichy and Paris, France, Sept. 26, 1954. For information write: Dr. Giulio Ammirandoli, Via Della Torretta 11. Montecatini Terme, Italy.

CONGRESS OF INTERNATIONAL SOCIETY OF UROLOGISTS, Athens, Greece, April 1955. Prof. Z. Kairis, 25 rue Voukourestiou, Athens, Greece, Secretary-General.

EUROPEAN SOCIETY OF CARDIOVASCULAR SURGERY, Edinburgh, Scotland, July 9-10, 1954. For information address: Mr. A. J. Slessor, Department of Surgery, University New Building, Edinburgh 8, Scotland.

INTER-AMERICAN CONGRESS OF RADIOLOGY, Shoreham Hotel, Washington, D. C., U. S. A., April 24-29, 1955. Dr. Eugene P. Pendergrass, 3400 Spruce St., Philadelphia 4, Pa., U. S. A., Secretary General.

INTER-AMERICAN SESSION, AMERICAN COLLEGE OF SURGEONS, Universidad Mayor de San Marcos de Lima, Lima, Peru, S. A., Jan. 11-14, 1955. Dr. Michael L. Mason, 40 East Erie St., Chicago 11, Ill., U. S. A., Secretary.

INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Ambassador Hotel, Los Angeles, Calif., U. S. A., Oct. 10-14, 1954. For information write: Dr. T. H. Seldon, 102-110 Second Avenue S.W., Rochester, Minn., U. S. A.

INTERNATIONAL CANCER CONGRESS, Sao Paulo, Brazil, July 23-29, 1954. Prof. A. Prudente, 171 rua Benjamin Constante, Sao Paulo, Brazil, President.

INTERNATIONAL CONFERENCE ON THROMBOSIS AND EMBOLISM, Basle, Switzerland, July 20-24, 1954. Dr. W. Merz, Chief Medical Officer, Gynecological Clinic, University of Basle, Basle, Switzerland, Hon. Secretary.

INTERNATIONAL CONGRESS OF CLINICAL PATHOLOGY, Washington, D. C., U. S. A., Sept. 6-10, 1954. Dr. Robert A. Moore, Washington University School of Medicine, St. Louis 10, Mo., U. S. A., Chairman, Committee on Arrangements.

INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST, Barcelona, Spain, Oct. 4-8, 1954. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Ill., U. S. A., Executive Secretary.

INTERNATIONAL CONGRESS ON GROUP PSYCHOTHERAPY, Toronto, Ont., Canada, Aug. 12-14, 1954. Dr. J. L. Moreno, Room 327, 101 Park Ave., New York 17, N. Y., U. S. A., Director of Organizing Committee.

INTERNATIONAL CONGRESS ON GYNECOLOGY AND OBSTETRICS, Geneva, Switzerland, July 26-31, 1954. Dr. H. de Watteville, Maternité Hôpital Cantonal, Geneva, Switzerland, President.

INTERNATIONAL CONGRESS OF HEMATOLOGY, Paris, Sept. 6-11, 1954. Dr. Jean Bernard, 86 rue d'Assas, Paris 6e, France, Secretary.

INTERNATIONAL CONGRESS OF THE HISTORY OF MEDICINE, Rome and Salerno, Italy, Sept. 13-20, 1954. For information write: Segreteria XIV Congresso Internazionale di Storia della Medicina, Instituto di Storia della Medicine, Citta Universitaria, Rome, Italy.

INTERNATIONAL CONGRESS OF HYDATID DISEASE, Madrid, Spain, Oct. 5-8, 1954. Dr. Jesus Calvo Melendro, Hospital Provincial, Sorea, Spain, Secretary General.

INTERNATIONAL CONGRESS OF INDUSTRIAL MEDICINE, Naples, Italy, Sept. 13-19, 1954. Professor Scipione Caccuri, Director, Institute of Industrial Medicine Policlinico, Naples, Italy, Chairman, Organizing Committee.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Stockholm, Sweden, Sept. 15-18, 1954. Professor Anders Kristenson, Karolinska Sjukhuset, Stockholm 60, Sweden, Secretary-General.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, University of Toronto, Toronto, Ontario, Canada, Aug. 14-21, 1954. For information write: Executive Officer, International Congress on Mental Health, 111 St. George St., Toronto, Ontario, Canada.

INTERNATIONAL CONGRESS OF NUTRITION, Amsterdam, Netherlands, Sept. 13-17, 1954. Dr. M. van Eekelen, Centraal Instituut voor Voedingsonderzoek T.N.O., 61 Catharynesingel, Utrecht, Netherlands, General Secretary.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY, University of Montreal and McGill University, Montreal, Canada, Sept. 9-11, 1954, and Waldorf-Astoria, New York, N. Y., U. S. A., Sept. 12-17, 1954. Dr. William L. Benedict, 100 First Avenue Building, Rochester, Minn., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF ORTHOPEDIC SURGERY AND TRAUMATOLOGY, Berne, Switzerland, Aug. 30-Sept. 3, 1954. For information write: Professor M. Dubois, Isle-Hospital, Berne, Switzerland.

INTERNATIONAL CONGRESS FOR PSYCHOTHERAPY, Zurich, Switzerland, July 21-24, 1954. Dr. H. K. Fierz, Theaterstrasse 12, Zurich 1, Switzerland, Secretary General.

INTERNATIONAL GERONTOLOGICAL CONGRESS, London and Oxford, England, July 12-22, 1954. Prof. R. E. Tunbridge, General Infirmary, Department of Medicine, The University, Leeds, England, President.

INTERNATIONAL HOSPITAL CONGRESS, Lucerne, Switzerland, May 30-June 3, 1955. Capt. J. E. Stone, International Hospital Federation, 10 Old Jewry, London, E.C.2, England, Hon. Secretary.

INTERNATIONAL INSTITUTE ON CHILD PSYCHIATRY, Toronto, Canada, Aug. 13-14, 1954. Miss Helen Speyer, International Association for Child Psychiatry, 1790 Broadway, New York 19, N. Y., U. S. A., Executive Officer.

INTERNATIONAL POLIOMYELITIS CONGRESS, University of Rome, Orthopedic Clinic, Rome, Italy, Sept. 6-10, 1954. Mr. Stanley E. Henwood, 120 Broadway, New York 5, N. Y., U. S. A., Executive Secretary.

INTERNATIONAL SOCIETY OF ANGIOLOGY, North American Chapter, Hotel Mark Hopkins, San Francisco, Calif., U. S. A., June 19, 1954. Dr. Henry Haimovici, 105 East 90th St., New York, N. Y., U. S. A., Secretary.

INTERNATIONAL SOCIETY OF BLOOD TRANSFUSION, Paris, France, Sept. 12-19, 1954. For information write: Colonel Julliard, Société Internationale de Transfusion Sanguine, 53 Boulevard Diderot, Paris 12e, France.

INTERNATIONAL SOCIETY FOR CELL BIOLOGY, Leiden, Netherlands, Sept. 1-7, 1954. Professor Peter J. Gaillard, University of Leiden, Leiden, Netherlands, Secretary.

INTERNATIONAL SOCIETY OF GEOGRAPHICAL PATHOLOGY, Washington, D. C., U. S. A., Sept. 6-10, 1954. Professor Fred C. Roulet, Hebelstrasse 24, Basel, Switzerland, Secretary-General.

IRISH MEDICAL ASSOCIATION, Killarney, Ireland, July 7-10, 1954. Dr. P. J. Delaney, 10, Fitzwilliam Place, Dublin, Ireland, Medical Secretary.

JAPAN MEDICAL CONGRESS, Kyoto University and Kyoto Prefectural Medical College, Kyoto, Japan, April 1-5, 1955. Dr. Mitsuharu Goto, University Hospital, Medical Faculty of Kyoto University, Kyoto, Japan, Secretary General.

LATIN AMERICAN CONGRESS ON GYNECOLOGY AND OBSTETRICS, Sao Paulo, Brazil, July 10-15, 1954. Prof. Dr. Jairo Ramos, av. Brigaderio Luiz Antonio, 278-8° andar, Sao Paulo, Brazil, Chairman of Organizing Committee of Medical Congresses.

LATIN AMERICAN CONGRESS ON MENTAL HEALTH, Sao Paulo, Brazil, July 17-22. For information address: Professor A. C. Pacheco e Silva, Avenida Brigadeiro Luiz Antonio 651, Sao Paulo, Brazil.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION CONGRESS, Lake Garda, Italy, Sept. 15-21, 1954. Dr. Ada Chree Reid, 118 Riverside Drive, New York 24, N. Y., U. S. A., President.

PAN AMERICAN CONGRESS OF GASTROENTEROLOGY, Sao Paulo, Brazil, July 19-24, 1954. For information address: Dr. Jairo Ramos, Avenida Brigadeiro Luiz Antonio 278-8° andar, Sao Paulo, Brazil.

PAN AMERICAN CONGRESS OF OPHTHALMOLOGY (Interim), Sao Paulo, Brazil, June 17-21, 1954. Dr. Moacyr E. Alvaro, Consolacao 1151, Sao Paulo, Brazil, President.

PAN AMERICAN CONGRESS OF PEDIATRICS, Sao Paulo, Brazil, Aug. 1-7, 1954. For information address: Dr. Jairo Ramos, Avenida Brigaderio Luiz Antonio 278-8° andar, Sao Paulo, Brazil.

PAN AMERICAN HOMEOPATHIC MEDICAL CONGRESS, Hotel Gloria, Rio de Janeiro, Brazil, S. A., Oct. 2-13, 1954. Dr. Paul S. Schantz, 103 West Main St., Ephrata, Pa., U. S. A., Executive Secretary.

PAN-PACIFIC SURGICAL CONGRESS, Honolulu, Hawaii, Oct. 7-18, 1954. Dr. F. J. Pinkerton, Suite 7, Young Bldg., Honolulu 13, Hawaii, Director General.

SOUTH AMERICAN CONGRESS OF ANGIOLOGY, Sao Paulo, Brazil, July 1954. For information write: Dr. Rubens Carlos Mayall, Rua Senador Vergueiro 73, Rio de Janeiro, Brazil, S. A.

WORLD CONGRESS OF CARDIOLOGY, Washington, D. C., U. S. A., Sept. 12-18, 1954. Dr. L. W. Gorham, 44 East 23d St., New York 10, N. Y., U. S. A., Secretary-General.

WORLD CONGRESS OF INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES, Scheveningen-The Hague, Netherlands, Sept. 13-17, 1954. Secretariat: Miss H. P. Post, Pieter Lastmarkade 37, Amsterdam Z, Netherlands.

WORLD FEDERATION OF OCCUPATIONAL THERAPISTS, Edinburgh, Scotland, August 17, 1954.

WORLD MEDICAL ASSOCIATION, Rome, Italy, Sept. 26-Oct. 2, 1954. Dr. Louis H. Bauer, 345 East 46th St., New York 17, N. Y., U. S. A., Secretary-General.

DEATHS

John, Joseph Franklin ✠ Eureka Springs, Ark.; born in Glendale, Ark., April 10, 1875; University of Nashville Medical Department, 1905; in 1938 second vice-president of the Arkansas Medical Society and from 1941 to 1945 councilor of the ninth district; during World War II a member of the State Procurement Board of Selective Service; patriotically served his country in the administration of the Selective Service System, was awarded certificates of appreciation by both President Roosevelt and President Truman, and was awarded a medal for this service; from 1915 to July, 1953, when he retired, city health officer of Eureka Springs; for many years member of the board of education; honorary chief of staff, Boone County Hospital in Harrison; served as president of the chamber of commerce; died March 24, aged 78, of coronary thrombosis.

Cook, Philip Howard ✠ Worcester, Mass.; born in Portland, Maine, in 1878; Harvard Medical School, Boston, 1903; an Associate Fellow of the American Medical Association; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society, New England Roentgen Ray Society, of which he was past president, and the American College of Radiology; chairman, board of trustees of the Worcester Medical Library; member of two medical advisory boards in World Wars I and II; affiliated with Worcester City Hospital, Memorial Hospital, and Hahnemann Hospital; consulting radiologist at Grafton State Hospital in North Grafton, Worcester County Sanatorium, and Fairlawn Hospital; died March 25, aged 76.

Boomer, Paul C., Chicago; Northwestern University Medical School, Chicago, 1892; died in Morton F. Plant Hospital, Clearwater, Fla., Feb. 4, aged 85, of myocardial failure and postoperative shock.

Branower, Jacob ✠ New York City; Long Island College Hospital, Brooklyn, 1915; member of the American Society of Anesthesiologists; on the staff of the Lebanon Hospital; died in Mount Sinai Hospital March 16, aged 60, of subdural hematoma.

Bristow, Henry Bernard, Tappahannock, Va.; Medical College of Virginia, Richmond, 1903; died Feb. 19, aged 74, of myocarditis.

Brown, Paul Richard ✠ Tulsa, Okla.; University of Maryland School of Medicine, Baltimore, 1901; past president of the Tulsa County Medical Society; veteran of the Spanish-American War and World War I; died in the Hillcrest Hospital March 22, aged 77, of pneumonia.

Byle, Archie Smith, Pine Island, Fla.; Hering Medical College, Chicago, 1909; died Feb. 22, aged 68, of carcinoma of the right lung.

Coppage, J. Marion, Macon, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1909; died in Macon Hospital Jan. 27, aged 71.

Goodson, Thomas Neavitt, San Antonio, Texas; University of Texas School of Medicine, Galveston, 1908; for 20 years county health officer; served overseas in France during World War I; died in Waco recently, aged 70, of coronary thrombosis and pneumonia.

Heldring-Fabricius de Heukelum, Leonard Johannes C., De Land, Fla.; Bennett Medical College, Chicago, 1897; an Associate Fellow of the American Medical Association; member of the Illinois State Medical Society; life member of the Association of Military Surgeons of the United States and of the Art Institute of Chicago; died Feb. 10, aged 79, of pulmonary hemorrhage.

Kendrew, Thomas, Indianapolis; Physio-Medical College of Indiana, Indianapolis, 1909; College of Medicine and Surgery (Physio-Medical) Chicago, 1911; died March 9, aged 81, of metastatic carcinoma of the liver.

Kreger, Oliver Judson ✠ Monessen, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; affiliated with Charleroi-Monessen Hospital in Charleroi; died in St. Petersburg, Fla., Feb. 24, aged 78, of infarction of myocardium and coronary thrombosis.

Moore, Thomas Frank, St. Petersburg, Fla.; Western Pennsylvania Medical College, Pittsburgh, 1902; died in St. Anthony's Hospital Feb. 10, aged 80, of cor pulmonale.

Patterson, Anne Houston, Staunton, Va.; Woman's Medical College of Baltimore, 1891; died Feb. 9, aged 86.

Roberts, Walter Joseph ✠ Rochester, N. H.; Medical School of Maine, Portland, 1906; died in Fort Lauderdale, Fla., March 14, aged 69, of coronary thrombosis.

Rogers, Wilson Chalmers ✠ Hemingway, S. C.; Medical College of the State of South Carolina, Charleston, 1912; served during World War I; died March 8, aged 67, of acute coronary occlusion.

Rulfs, Carl Henry, San Augustine, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1905; served during the Spanish-American War; city and county health officer; died Jan. 11, aged 75, of arteriosclerosis.

Shacklett, Henry Blant ✠ Spring Hill, Ala.; Louisville (Ky.) Medical College, 1896; an Associate Fellow of the American Medical Association; member of the Indiana State Medical Association; died March 12, aged 81, of a heart attack.

Siebert, Alfred Adolph ✠ Oakland, Calif.; St. Louis University School of Medicine, 1927; served on the staffs of the Permanente Hospital in Oakland, and Herrick Hospital in Berkeley; died March 21, aged 57, of cardiac failure.

Sizemore, Daniel Middleton ✠ Sulligent, Ala.; University of Nashville (Tenn.) Medical Department, 1907; past president of the Lamar County Medical Society; died in Gilmore Sanitarium in Amory, Miss., March 16, aged 74, of cancer of the lung.

Strong, Samuel Benjamin, Palatka, Fla.; Bennett Medical College, Chicago, 1906; died Feb. 6, aged 75.

Sult, Charles William ✠ Phoenix, Ariz.; Georgetown University School of Medicine, Washington, D. C., 1906; state health commissioner of Arizona from 1931 to 1933; affiliated with St. Joseph's Hospital, where he was a member of the board and where he died Feb. 24, aged 74, of heart disease and uremia.

Sutter, Charles Culley, Evansville, Ind.; Indiana University School of Medicine, Indianapolis, 1910; past president of the Vanderburgh County Medical Society; served during World War I; died in the Deaconess Hospital Feb. 3, aged 65.

Terrill, S. Smith, Minneola, Fla.; Miami Medical College, Cincinnati, 1895; formerly practiced in Memphis, Tenn.; died in the South Lake Memorial Hospital, Clermont, Feb. 12, aged 84, of adenocarcinoma of the pharynx.

Tyner, Richard Howard ✠ Gloversville, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1930; affiliated with Nathan Littauer Hospital; died in the Mercy Hospital, Miami, Fla., Feb. 4, aged 58, of acute myocardial infarction.

Udkow, Samuel ✠ New York City; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1934; served during World War II; affiliated with Lebanon Hospital; died Feb. 28, aged 47, of a heart attack.

Wood, Ernest, Galena, Ohio; Rush Medical College, Chicago, 1902; formerly affiliated with the Ohio Hospital for Epileptics; died Feb. 28, aged 78.

Wright, Charles Aaron ✠ Wautoma, Wis.; Hahnemann Medical College and Hospital of Philadelphia, 1902; died in Berlin Feb. 21, aged 78, of cerebral embolism and myocardial ischemia.

FOREIGN LETTERS

CHILE

Artificial Circulation and Oxygenation.—At a meeting of the Chilean Heart Society in December, Prof. F. Rojas Villegas and co-workers, after making a brief resumé of all the techniques for artificial circulation and oxygenation at present available, reported their own experience that started in 1952. The newer concepts of the physiopathology of heart failure tend to regard it as a vicious circle in that it produces retention of electrolytes and water by the kidney that in turn increases the venous return to the heart. This distends the heart muscle thereby increasing the strength of contraction of the heart muscle. In time this mechanism of cardiac compensation turns out to be one of the most important factors in cardiac decompensation. The authors believed that, if they could divert a part of the blood returning to the heart, oxygenate it, and reinject it into the aorta at an adequate pressure even for an hour or two, it would be possible to break this vicious circle. Since their aim was to divert part rather than all of the blood returning to the heart, they built a very simple apparatus. The first object was the withdrawal of venous blood and its reinjection into the arterial system, and the second object was the oxygenation of the blood thus performing the work of the heart and the lungs. The first objective was solved by using electric pumps similar to those pumping gasoline in motor cars. Oxygenation was not so easy. In the beginning the production of foam created serious difficulties. After many trials they devised two concentric cylinders made of a thick metallic mesh and spun by an electric motor at a velocity of about 70 rpm in a cylindrical flask.

This apparatus proved to be highly efficient, as there was a good oxygenation of the blood with a minimum of foaming. The next step was to determine the adaptability of this machine in live animals. In the beginning, the experiments were not made with the idea of keeping the animal alive but to observe the adaptability of the machine. Dogs weighing 15 to 30 kg. were anesthetized with 0.25 to 0.75 gm. of thiopental sodium. After injecting 50 to 80 mg. of heparin intravenously, the carotid and jugular vessels were exposed. A cannula was introduced into the artery thus permitting the reflux of the blood into the expulsion chamber of the machine. The vein was then connected with the other pump of the machine, and, when both pumps were working, blood passed through the oxygenating flask that was previously filled with 100 to 150 cc. of a heparinized isotonic sodium chloride solution. In the next series of tests, the extent of hemolysis, the acid-base equilibrium, and the degree of oxygenation of the blood was studied. Oxygenation was perfect, but the alkaline reserve tended to decrease. This was corrected by adding a small quantity of sodium bicarbonate. The hemolysis originally observed occurred because the blood mixed with a certain amount of water that was used to clean the apparatus. When the machine was cleaned with 3 liters of isotonic sodium chloride solution previous to its use, hemolysis no longer occurred. The third step in these experiments was a study of the life span of the animals that were subjected for various periods of time to the artificial circulation. At the end of each experiment, 50 mg. of protamine sulfate was given in order to neutralize the heparin, and 500,000 units of penicillin was injected. The anesthesia used was always thiopental sodium given intravenously. In the last four experiments, Phenergan (10-[2-dimethylamino-1-propyl] phenothiazine) and meperidine were used thus improving the tolerance of the animal. It was calculated that between 60 and 90% of the total circulation passed through the machine. Because two of the dogs died and their deaths were attributed to the fact that the artificial circulation was done through the carotid artery and the jugular vein, the femoral artery and vein were used in subsequent experiments and no further deaths occurred.

The items in these letters are contributed by regular correspondents in the various foreign countries.

Renal Changes in Diabetics.—Dr. M. Plaza de los Reyes and his co-workers reported on a series of 12 women and 4 men whose ages ranged from 49 to 66 years (*Revista médica de Chile*, Dec., 1953). All patients had clinical manifestations of diabetes and nephropathy. Thirteen were being treated with insulin. In 12 the diabetes had existed for less than 10 years. Edema was present in five of the patients, and in one it was due to heart failure. In 14 there was hypertension, and manifestations of heart failure were present in various degrees in 6. Peripheral arteriosclerosis was present in 12. Fluoroscopy revealed increase in the size of the heart and aorta in 10. In more than half the patients the electrocardiogram showed signs of hypertrophy of the left side of the heart. The eyegrounds showed typical diabetic changes in 11 patients. Hyperglycemia was present in all of the patients and uremia in 11. Ten patients showed albuminuria, and two had casts. Only three showed hemoglobinuria, but nine had an Addis count of more than 1 million red blood cells. Urinary infection was present in nine patients. In 9 the blood protein levels were normal, but the albumin-globulin ratio was less than 1.5 in 12 patients. Lipemia was increased in 12, and the rate of glomerular filtration was decreased in 10. Pyelography revealed renal ptosis in five patients. Of the 16 patients, 13 presented clinical evidence of diffuse nephritis that was confirmed by laboratory tests. The urea clearance was altered in eight of the patients, renal ischemia being present in seven. The authors stressed the value of the Addis count that revealed hematuria in eight patients in whom it was not otherwise detected. In contrast to the findings of most observers, albuminuria was not present in all the patients. As a control group, 15 patients with diabetes without renal complications were studied. While the average age of the diabetic with nephropathy was 58, the average age of the control group was 48 years. In most patients in the control group the eyegrounds were normal. In the control group the blood cholesterol level was normal, whereas in the other group it was always high. This abnormality might explain the presence of arteriosclerosis in the group with nephropathy. The practically constant fall in serum albumin in patients with diabetic nephropathy but not in diabetics without such a complication might suggest that the renal changes are intimately associated with changes in the proteinemia.

Antituberculosis Campaign.—In February an agreement was signed by the Chilean government, WHO, and UNICEF in order to increase the antituberculosis campaign. The following recommendations were made: (1) make tuberculin tests on all inhabitants of the rural zones of the country between the ages of 1 to 30 years; (2) vaccinate all persons who have positive reactions with BCG; and (3) train physicians and nurses in the technique of tuberculin testing and BCG vaccination. With this in mind, WHO has provided scholarships that will enable two physicians to study abroad. The vaccination campaign with BCG will be incorporated in the general tuberculosis control program and will last 21 months, after which the government will take steps to insure the vaccination of all newborn infants and such other persons as are believed to require it. In order to insure the success of the task, WHO will supply technical personnel and UNICEF will supply the necessary equipment. The first six months of the campaign will be spent in the production of BCG by a new laboratory that has been specially designed and in the training of the necessary personnel.

Brucellosis.—Drs. G. Lira and H. Andrade of the food department of the National Health Service reported that in 1952 there were in Chile 475,000 cows used for the production of milk, providing 102 liters of milk per capita per year. These figures reveal an increase in the production of milk in the last 25 years. Thus in 1926 it was 36, from 1928 to 1937 it was

40, and from 1941 to 1945 it was 61 liters per capita. In spite of this threefold increase in the last 25 years, production is still 23% short of the goals that were set for the year 1952. The authors calculate that there is an increase of 3.04 liters of milk per capita per year and that the goal for 1952 of 150 liters will not be reached until 1962. Production can be accelerated, however, if better selection of the herds, better feeding, and application of prophylactic steps to control bovine diseases are adopted. Among the diseases that affect the production of milk, foot and mouth disease, tuberculosis, and brucellosis are important. In the United States, a decrease in the incidence of brucellosis from 10% to 5% saved 50 million dollars for the milk industry. In Chile the incidence of brucellosis is 15% in selected and 30% in nonselected herds. This results in a loss of about 59,179,000 liters of milk annually.

ENGLAND

Civil Service Medical Officers' Pay.—The pay of three grades of medical officers in the civil service has now been revised and the new scales are to operate as from Jan. 1, 1952. A claim was first presented to the treasury in August, 1949, but in February, 1950, it was rejected. The Chancellor of the Exchequer then decided to appoint a committee to consider the remuneration, structure, and organization of the medical civil service, and this committee reported to the chancellor in August, 1951. The proposed scales recommended by them were not accepted by the civil service medical officers or by the British Medical Association, and in July, 1952, the representative body of the British Medical Association decided not to publish further advertisements for civil service medical officers until a satisfactory agreement had been reached. A steady campaign was carried out by the Civil Service Medical Officers' Joint Committee, and eventually the treasury agreed to make fresh proposals. The new scales provide for medical officer, $4,200 to $5,880; senior medical officers, $6,160; and principal medical officer, $6,440. The minimum of $4,200 is linked to age 35 and is subject to increments for each year above that age up to 42. For each year of age below 35, it is subjected to a deduction of $140. These scales and rates are the same for women as for men. Agreement on these terms are entered into by both parties on the following understanding. 1. Both parties remain free to ask the Royal Commission on the Civil Service to consider any proposals they think fit about the remuneration of all grades in the medical officer class—this particularly applies to the rates of pay for senior and principal medical officers, the increases in which both sides regard as purely token. 2. The scale now agreed for the basic grade cannot be regarded as establishing any particular relativity between that grade and any grade or grades in other classes in the civil service. 3. No new arrangements made in the remuneration of medical work outside the civil service—for instance, in the remuneration of consultants or other hospital medical staff in the National Health Service—will be made the basis of a claim to the treasury prior to the publication of the report of the Royal Commission, but this in no way limits either party's freedom of action in using any such factors in its submissions to the Royal Commission or in using any other new considerations in fresh representations either before or after the Royal Commission has reported.

The *British Medical Journal* for April 24, 1954, comments that in the summer of 1950 anxiety over recruitment, already at an increasingly low ebb, and a serious shortage of physicians in the civil service forced the treasury to take some action, but the increases recommended were so meager that the physicians rejected them. Reluctantly the treasury entered into direct negotiations with the joint committee with the result now described. Whatever recommendations may come from the Royal Commission—and there can be no doubt that the need for attracting recruits of high quality to this small but important branch of the profession will be well in its mind—the British Medical Association, working with the joint committee, has through its persistence achieved a notable feat in moving an unyielding treasury on behalf of a minority of its members, even though it did not move it all the way.

Deaths from Cancer and Tuberculosis.—According to the 1953 returns of the Registrar-General, issued April 3, deaths of men from cancer of the lung and bronchus have increased by 57% since 1947. The rate per million of population increased to 607 from 568 in 1952; the rate for women remained steady at 99 per million. Death rates from all forms of cancer during 1953 were 2,165 and 1,836 per million population for men and women respectively. Of the 45,924 deaths of men, 12,873 (28%) were due to cancer of the lung or bronchus; and of the 41,989 deaths of women from cancer, 2,255 (5%) were due to these lesions. Deaths from pulmonary tuberculosis showed a decrease of 16% compared with the previous year and more than 60% compared with 1947. This reflects the increasing effectiveness of chemotherapy. Death from other forms of tuberculosis, 22 per million persons, was also down in 1953, the figure for the previous year being 28.

Royal College and American College of Surgeons.—Part of the rebuilding of the Royal College of Surgeons of England in Lincoln's Inn Fields, severely damaged by enemy action in 1941, is now completed, notably the great hall with accomodation for about 800 seats and the council chamber, and all is in impressive order for the first sectional meeting of the American College of Surgeons to be held in the United Kingdom (May 17, 18, 19). For over 18 months the British Committee of Arrangements has worked under the chairmanship of Sir Cecil Wakely, president of the royal college, with Mr. Lawrence Abel, a London surgeon and member of the council of the college as honorary secretary, working in close conjunction with Dr. Prather Saunders, the associate director of the American College of Surgeons.

SWEDEN

Sir Almroth Wright's Biography.—The recent publication in London of a biography by Dr. Leonard Colebrook of Sir Almroth Wright is of special interest to Sweden, because Wright's mother was the daughter of a professor of chemistry at the Karolinska Medico-Surgical Institute and at the Royal Artillery School of Stockholm. One of her grandchildren described her as "rather a fierce old lady," and Colebrook remembers her as a somewhat gaunt, tall figure with a strong, resonant voice despite her 70 years. She is credited with saying that "Almroth was always my failure: I could never make him do what I wanted." Colebrook's biography reveals Wright as a many-sided genius. Primarily a bacteriologist, his introduction of typhoid vaccination in the South African War, his discovery of opsonins, and his masterly laboratory technique with a minimum of elementary apparatus are common knowledge. Less is known of him as a philosopher and linguist. He had a thorough background in Greek and Latin and read French, German, Italian, and Spanish. In his seventies, he taught himself Russian, and when he was nearly 80 he started to learn the Eskimo language. He read law at one time and was always interested in logic. He died in 1947 at the age of 85.

Institute for Tropical Medicine.—Hitherto no provision has been made in Sweden for the study and treatment of tropical diseases in a central institute. The Swedish Missionary Council has taken the initiative in planning a tropical diseases hospital to be affiliated with the fever hospital in Jönköping. Its medical superintendent, Dr. Olle Gabinus, has studied the subject in England and has also undertaken to visit the council's mission field in order to familiarize himself with his new duties. Although the fever hospital is a provincial institution, it will be a national agency serving the whole country and financed from national and local sources. It should soon no longer be necessary for patients suffering from tropical diseases to be sent abroad for treatment or for physicians to have to study tropical diseases in foreign countries. In addition to missionaries, the new institute will serve seamen and others returning home with malaria and other tropical diseases.

CORRESPONDENCE

CIGARETTES

To the Editor:—Since at least one of the manufacturers of filtered cigarettes used the results of tests of the laboratory of the American Medical Association in advertising, implying that there is a definite added safety factor, I believe that the following information should be available. During the past years, we have tested a variety of filtered cigarettes as well as the so-called denicotinized cigarettes and have yet to find any that contain tobaccos that do not produce a response in the vascular system as measured by drops in temperatures of the finger tips and other determinations. In addition, we have repeatedly observed that relapse in thromboangiitis obliterans may occur when patients smoke the filtered cigarettes. Two days ago, we admitted a patient to the New York Hospital who presents a perfect example of this. This patient first had active thromboangiitis obliterans in 1940. In 1941, he stopped smoking and his symptoms remained quiescent until 1949 when he started to smoke. Within six months gangrene of three toes developed. Once more, on abstinence from smoking and with other therapy, the disease became quiescent, and the man was free from symptoms. About four months ago, impressed by the advertising of filtered cigarettes, he started to smoke filtered cigarettes. Again, his disease has been reactivated, and he has early signs of pregangrenous involvement of the tips of two toes.

I can make no comments regarding the value of filtering out appreciable quantities of tars and other oils in terms of cancer of the lungs, but I do feel that the present advertising implies protection in rather vague, but none the less impressive terms and it may influence patients with vascular disease, who have, with great effort on the part of their physician and themselves, stopped smoking, to resume once more on the assumption that there is a markedly reduced risk if they smoke filtered brands. There is absolutely no evidence that there is any protection in terms of vascular disease from these brands; on the other hand, there is quite strong evidence that such protection is completely lacking. This letter presents what may become a serious problem for patients and physicians who are interested in diseases of peripheral circulation.

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LIQUID NITROGEN FOR DERMATOSES

To the Editor:—Having had experience with liquid nitrogen in the treatment of various dermatoses, I have often been questioned regarding the practical factors in its use. Liquid nitrogen is noninflammable and has a boiling point of −195 C (−319 F). Its therapeutic value is due to its ability to freeze the skin and cause blistering of varying degrees, depending on the duration of exposure. Liquid nitrogen has an advantage over solid carbon dioxide (dry ice) for thickened lesions. The technique of application consists of moistening a cotton-tipped applicator stick with liquid nitrogen and applying it to the skin for periods ranging from 10 to 60 seconds, depending on the reaction desired.

Treatment of common warts consists of application of liquid nitrogen about four to eight times at weekly intervals, 10 to 15 seconds being satisfactory for small warts, 30 seconds for large warts, and 60 seconds for plantar warts. The patient is warned of the anticipated reaction and advised to keep the lesions dry. This technique is particularly applicable for large clinics or university health services, as treatment may be undertaken by a nurse under the direction of a physician. Warts that respond too slowly may be treated by other methods. Angiomas and spider nevi respond to repeated 10 second applications of liquid nitrogen. The treatment of granuloma annulare is particularly effective when liquid nitrogen is applied for about 15 seconds once each week. Seborrheic and senile keratoses may be treated by similar means with excellent cosmetic results.

Liquid nitrogen may be obtained in no less than 5 liter quantities at a cost of about $7.50. It evaporates in about two days. The small amount of it to be used may be poured into a thermos bottle that has been thoroughly cooled in an icebox, although there is always the danger of cracking the liner. A cotton plug is used in place of a stopper in order to prevent a dangerous accumulation of pressure in the container. A Dewar flask especially made for holding liquid nitrogen may be obtained from any chemical supply house.

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ULCER PATIENTS AND DIETS

To the Editor:—In the article "Management of Ulcer Symptoms After Vagotomy" (*J. A. M. A.* **154:**1345-1437 [April 17] 1954), under the heading dumping syndrome and hypoglycemic reactions, Wilkins and associates state that "In the treatment of this syndrome, the diet should be modified so that the meals are small and frequent and have a considerable reduction in the free sugar content. . . . The principle of this diet is the reduction of the carbohydrate content to around 200 gm. and an absolute withdrawal of carbohydrates in the form of freely soluble monosaccharides and disaccharides. The diet is relatively high in protein and fat. . . . In patients with less severe forms of hypoglycemia, the total carbohydrate content need not be restricted, but the free sugar content of the diet is eliminated."

In reference to this point, I would like to call attention to an article by myself and Dr. A. P. Kane (The Effect of Equivalent Amounts of Dextrose and Starch on Glycemia and Glycosuria in Diabetics, *Am. J. M. Sc.* **189:**545-550, 1935). We have found that in diabetics the glycemia and glycosuria after the ingestion of 100 gm. of dextrose and after the ingestion of 90 gm. of starch were identical. The complete hydrolysis of 90 gm. of starch yields 100 gm. of dextrose. The digestion of starch, therefore, proceeds at such a rate that the amount of dextrose absorbed from the intestine per unit time when 90 gm. of starch are ingested is equal to the amount absorbed when 100 gm. of dextrose is ingested. Carbohydrate is the most potent stimulant of insulinogenesis; protein is much less so; fat is almost negligible. The fundamental principle in treatment, therefore, is to give a low carbohydrate, high protein, high fat diet. The nature of the carbohydrate—whether polysaccharide, disaccharide, or monosaccharide—is, from the practical standpoint, unimportant.

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IATROGENIC HEART DISEASE

To the Editor:—I am writing about my article that appeared in The Journal, Nov. 7, 1953, page 910. I wish to state that some of the material used in that paper was taken from an article on iatrogenic heart disease published in the *Annals of Internal Medicine* (**38:**9-22 [Jan.] 1953) by Dr. Harry B. Weinberg. It is my wish to give Dr. Weinberg due credit.

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BUREAU OF INVESTIGATION

COUGH MEDICINE FOR CANCER?

In the case of Hoxsey vs. Fishbein and others, commented on in a report of the Bureau of Investigation in THE JOURNAL [1] there was filed in 1949 on behalf of the defendants served in that case a motion that Mr. Harry Hoxsey, the plaintiff, be ordered to produce all his written formulas, which he contends are remedies for the treatment or cure of cancer. The federal court in Dallas, Texas, entered an order directing him to produce written formulas of the alleged external and internal remedies used in the treatment of cancer in his Dallas clinic. Pursuant to that order, Mr. Hoxsey filed in court a document signed by him, in which it was stated, among other things, that the constituent elements of the remedy used in the Hoxsey Cancer Clinic as "Hoxsey's Internal Cancer Medicine" were as follows (spellings his):

	(Common Names)
Xanthoyllum Fraxineuem	Prickly Ash Bark
Rhanus Frangula	Buckthorn
Rahnus Pursihana	Cascara
Kali Iodatum K 16602	Potassium Iodide
Medicheo Sativa	Alfalfa
Trifolium Pratense	Red Clover
Sy. of Honey Drip Cane	Sugar Syrup

Analysis by chemists disclosed that Hoxsey's brownish-black internal "cancer medicine" contained about equal parts of potassium iodide and cascara, and about 96% water. A nurse employed by Hoxsey for many years testified that she frequently mixed the brownish-black "cancer medicine" and that she used about 4 oz. each of potassium iodide and cascara in a gallon of tap water. She further testified that, in so doing, she filled a gallon glass jug half full of water. To this she added 4 oz. each of cascara and potassium iodide. After shaking the mixture well, she filled the jug with water.

In 1950 there was filed under the Federal Food, Drug and Cosmetic Act, in the name of the United States of America, a complaint in the federal court at Dallas, Texas, requesting an injunction to restrain the Hoxsey Cancer Clinic and Harry M. Hoxsey from causing to be delivered in interstate commerce certain medicaments for the alleged purpose of curing internal cancer. This case was commented on by the Bureau of Investigation [1] as was the appeal,[2] and it was prosecuted successfully by the government before the United States Circuit Court of Appeals for the Fifth Circuit at New Orleans. After the Supreme Court of the United States refused to review the decision of the Circuit Court of Appeals, a decree of injunction was signed Oct. 26, 1953, by the trial judge, following certain supplementary directions of the Circuit Court of Appeals, which, reading in part as follows, was ordered to issue:

"Decree of Permanent Injunction

". . . the following Injunction is ordered to issue:

"Ordered and Decreed that Hoxsey Cancer Clinic, a partnership doing business at Dallas, Texas, and Harry M. Hoxsey, of Dallas, Texas, and their agents, servants, employees, representatives, attorneys and assigns and all persons in active concert or participation with them are perpetually enjoined from directly or indirectly introducing or causing to be introduced and delivering or causing to be delivered for introduction into interstate commerce in violation of 21 U. S. C. 331 (a) the following drugs, so long as they are misbranded within the meaning of 21 U. S. C. 352 (a) as hereinafter set forth.

"The drugs referred to are:

(1) A brown or blackish-brown mixture which contains potassium iodide, sugar, water, and extracts from one or more of the following: cascara sagrada, common buckthorn, alfalfa, red clover blossoms, and northern prickly ash;

(2) a pink mixture, which contains potassium iodide and elixir lactate of pepsin; and

(3) any similar drugs.

1. Comment on Court Opinion That Internal Cancer Can Be Cured with Medicine, report of the Bureau of Investigation, J. A. M. A. 145: 252 (Jan. 27) 1951.

2. Mr. Hoxsey Has a Setback, report of the Bureau of Investigation, J. A. M. A. 150: 54 (Sept. 6) 1952.

"The misbranding under 21 U. S. C. 352 (a) which is prohibited by this injunction applies to said drugs, or any of them, the labeling of which is false or misleading in any particular within the meaning of said Act, and the use of labeling on said drugs, or any of them, of a white booklet entitled 'Hoxsey Cancer Clinic Specializing in Cancer', consisting of 44 pages, and a blue booklet entitled 'Hoxsey Cancer Clinic', consisting of 58 pages, which were involved in this action, are specifically prohibited; also, the labeling thereof which represents, suggests or implies that the drugs are beneficial, effective or have value in the cure, mitigation or treatment of any type of cancer in human beings is prohibited."

The liquid, dark brown Hoxsey cancer medicine is now labeled as follows:

16 Oz.
HOXSEY TONIC

31653

Each 5 cc contains:	
Potassium Iodide	150 mg.
Licorice	20 mg.
Red Clover	20 mg.
Burdock Root	10 mg.
Stillinga [sic] Root	10 mg.
Berberis Root	10 mg.
Poke Root	10 mg.
Cascara Amarga	5 mg.
Prickly Ash Bark	5 mg.
Buckthorn Bark	20 mg.

Dose: One teaspoonful after meals and at bedtime.

Prescribed by Dr. Staffa, D.O.

Distributed by
HOXSEY CLINIC
Dallas, Texas
Shake Well

Of the ingredients listed on the label of the Hoxsey Tonic, only potassium iodide has any recognized therapeutic activity. The drug is principally used as an expectorant in cough remedies. Even in this recognized use, the minimum dosage given is twice as much as that set forth in the directions printed on the label of Hoxsey Tonic, the "cancer medicine."

Any person possessing a modicum of knowledge of the pharmacological action of drugs should know that any combination of ingredients listed on the current label of Hoxsey Tonic or in the statement filed over Mr. Hoxsey's signature in federal court in Dallas, Texas, is without any therapeutic merit in the treatment of cancer. Any such person who would seriously contend that scientific medicine is under any obligation to investigate such a mixture or its promoter is either stupid or dishonest.

There is indication that certain persons, including a Pennsylvania state senator and several doctors of medicine, magazine editors, and newspaper editors, have sought to create in the minds of the public an idea that organized medicine, particularly the American Medical Association, will not give Mr. Hoxsey an opportunity to demonstrate his claimed cancer cure before the world, because it refuses to send representatives to Dallas, Texas, to investigate. It is fair to observe that the American Medical Association or any other association or individual has no need to go beyond the Hoxsey label to be convinced.

It is fair to observe, also, that Mr. Hoxsey (they call him "Doctor" in Texas, because he is a licensed naturopath there) decided he needed medical men to approve his remedy. He was able to get a few to go to Texas, and he published a report signed by them. At least, Mr. Winrod, the Wichita, Kan., publisher of the *Defender Magazine*, printed in the May, 1954, issue a picture of these medical men and a copy of their report. An excerpt is quite revealing: "We, as a committee, feel that the Hoxsey treatment is superior to such conventional methods of treatment as X-ray, radium and surgery. We are willing to assist this Clinic in any way possible in bringing this treatment to the American Public. We are willing to use it in our office, in our practice on our own patients when, at our discretion, it is deemed necessary." The men, facsimiles of whose signatures appear in the issue, are: S. Edgar Bond, M.D., Willard G. Palmer, M.D., Hans Kalm, M.D., A. C. Timbs, M.D., Frederick H. Thurston, M.D., D.O., E. E. Loffler, M.D., H. B. Mueller, M.D., R. C. Bowie, M.D., B. F. Bowers, M.D., and Roy O. Yeatts, M.D.

The Bureau of Investigation has in its files indication that six members of this group have used another alleged cancer remedy in their practice. Bond, Loffler, Mueller, Timbs, Yeatts,

and Palmer have used the Koch treatment. This has been the subject of earlier Bureau reports. They call the stuff Glyoxylide. It is currently labeled to be "a one to a trillion aqueous dilution of partially oxidized Inositol and the Reaction Product of acetaldehyde, ethyl alcohol and sulphuric acid."

Mr. Hoxsey employs three osteopaths as "staff" members of his clinic. The "chief of staff" was once in the business of selling electric face-lifters and cosmetic products. The government put a crimp in these activities when it required him to cease advertising that either the electric face-lifter or the lotions that he sold were capable of doing what he claimed for them. The "chief diagnostician" has been identified as a user of the Koch alleged cancer treatment. His name appeared on a program of the Christian Medical Research League as a member of its Medical Advisory Council. The league sells Glyoxylide.

Under the circumstances, the whole picture would be extremely ludicrous except for the appeal to the credulous and unreasoning, which can conceivably result in unnecessary injury, damage, and death to many persons, not from any overdose of the Hoxsey Tonic, but by reason of their relying on it instead of on proper, established procedures until their condition has progressed so far that they cannot be cured.

It appears that Mr. Hoxsey has convinced a state senator in Pennsylvania that he cures cancer with the Hoxsey Tonic. It is fair to say that but for his position as administrator of the Miners' Hospital at Spangler, Pa., the senator could be excused as not having an opportunity to know about Hoxsey and his tonic. As a hospital administrator, however, he could easily learn about the therapeutic merits of prickly ash bark, buckthorn, cascara, alfalfa, red clover, and the rest, including potassium iodide, in the treatment of cancer. He could ask any intelligent physician. Possibly he was misled by Dr. Bowers, because he is one physician at the said hospital who will use Hoxsey Tonic, "when, at his discretion, it is deemed necessary."

The characterization "stupid" certainly does not apply to the publisher of the *Defender Magazine*, the medical men, or the hospital superintendent. They have qualified for the mentioned alternative.

BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Motor Vehicles: Use in Court of Results of Chemical Test of Blood Sample Taken from Unconscious Person.—The defendant was convicted of manslaughter arising out of the operation of an automobile while under the influence of intoxicating liquor. The appellate court reversed the conviction, so the case was appealed to the Supreme Court of California.

The manslaughter charge arose out of an automobile accident. After the accident the defendant, driver of one of the cars, and the other injured persons were taken to an emergency hospital. At the hospital, and while the defendant was still unconscious, an attendant withdrew 5 cc. of blood from her arm. Four cubic centimeters were used to type her blood for a transfusion. The remaining blood was given to a technician for an alcohol analysis, which indicated an alcoholic content of 0.18%. From this a medical expert testified that the alcoholic content of the defendant's blood at the time of the accident was about 0.215% and that all persons are unable to drive safely when their blood alcohol level is more than 0.15%. The defendant claimed that the admission of testimony concerning the results of the blood test taken without her consent deprived her of due process of law.

The defendant based her claim of a denial of due process of law on *Rochin v. People*, 342 U. S. 165. In the Rochin case, the record showed that police officers, in search of narcotics, invaded the defendant's room without a warrant. Seeing Rochin put two capsules into his mouth, the officers "jumped upon" him and attempted to remove the objects. Unsuccessful, they took him, handcuffed, to a hospital where, by means of a tube, an emetic was injected into his stomach, causing him to vomit the capsules. Upon analysis the capsules were found to contain morphine, and in a subsequent trial on the charge of unlawfully possessing narcotics the capsules were the chief evidence against the defendant. Rochin was convicted in the trial court but on appeal to the United States Supreme Court the judgment of conviction was reversed, the court saying, "we are compelled to conclude that the proceedings by which this conviction was obtained do more than offend some fastidious squeamishness or private sentimentalism about combatting crime too energetically. This is conduct that shocks the conscience. Illegally breaking into the privacy of the petitioner, the struggle to open his mouth and remove what was there, the forcible extraction of his stomach's contents—this course of proceeding by agents of government to obtain evidence is bound to offend even hardened sensibilities. They are methods too close to the rack and the screw to permit of constitutional differentiation."

The defendant contended the Rochin decision held that any taking of evidence, by force, from the person of a defendant without his consent violates due process. In the present case, said the court, it is said by the defendant that such force consisted of puncturing her skin with a needle to withdraw blood. Prior California decisions declare that due process, as that term is used in the Fourteenth Amendment, does not embody the privilege against self-incrimination but that the privilege is guaranteed by the constitution of this state, which declares that "no person shall . . . be compelled in any criminal case, to be a witness against himself." Reviewing the scope and purpose of that provision, the Supreme Court of California has held, ". . . it is not merely any and every compulsion that is the kernel of the privilege, in history and in the constitutional definitions, but testimonial compulsion."

Evidence is not obtained by testamentary compulsion when it consists of a test of blood taken from an accused. It is not a communication from the accused but real evidence of the ultimate fact in issue—the defendant's physical condition. More pertinent to the present inquiry, the court continued, is the constitutional prohibition against unlawful searches and seizures. Freedom from unlawful intrusion was held to be basic to a free society and, being implicit in the concept of ordered liberty, enforceable against the states through the due process clause. Without deviation, the court continued, this court has held that competent evidence, although improperly obtained, is admissible in a criminal prosecution against the person from whom the evidence is taken. Elements of unlawfulness in the acquisition of evidence were present in the Rochin case, the initial entry and search being without the authority of a warrant. However, the basis for the decision is not that the evidence was acquired illegally. The Rochin case holds that brutal or shocking force exerted to acquire evidence renders void a conviction based wholly or in part on the use of such evidence. Contrary to the defendant's contention, the Rochin opinion does not rest on the premise that the taking of evidence from the person of a defendant or by entry into his body is the decisive factor. Instead, the entire course of conduct was examined and found to be brutal and shocking.

The taking of a blood test, when accomplished in a medically approved manner, does not smack of brutality, said the Supreme Court. In recent years, millions of young men have been subjected to such tests as an incident to induction into military service. In this state, a blood test is required of each person making application for a marriage license and physicians engaged in prenatal care of a pregnant woman, or attending such woman at the time of delivery, must obtain a sample of her blood for purposes of a test for venereal disease. Moreover, the court continued, in the present case, the defendant was unconscious at the time the blood was withdrawn and the removal of 4 of the 5 cc. of blood was necessary to provide medical treatment. The only unauthorized action of the medical attendant was to remove one additional cubic centimeter of blood after the hypodermic needle already had been inserted. Certainly, the court concluded, this conduct cannot be called shocking to the conscience and it does not support the defendant's claim of a violation of due process of law. Other of the defendant's contentions were also overruled and the judgment of conviction was affirmed. *People v. Haeussler, 260 P. (2d) 8 (California, 1953).*

COUNCIL ON MEDICAL SERVICE

PLACEMENT OF PHYSICIANS IN MICHIGAN

This is the ninth in the series of articles on state physicians placement services, based on information collected by medical students from Northwestern University Medical School who visited the states for the purpose of studying the program on the state level.

STATE CONDITIONS IN GENERAL

In a 1953 report to the governor of Michigan by the secretary of the Michigan State Medical Society and the deans of the two medical schools in the state, it was stated that Michigan has a physician-population ratio of 1:919. This is considerably more persons per physician than the national average of 1:749, and, in some parts of the state, the ratio is even higher. South of the so-called Bay City-Muskegon line, where the large industries of furniture, foundries, and automobiles are located, the state is densely populated and there is comparatively high concentration of medical personnel. This is also true of the farming areas of the southern portion of the state, in which there are many small communities; the central portion of the state, which includes the large resort areas; and the cut-over timber land and the northern coastal regions, which have abundant cherry orchards and many small industries. The northern peninsula of Michigan, however, presents an entirely different pattern of life with its very sparse population. All of these factors affect physician distribution in the state, since the different ways of living available in the various regions all have their attractions.

A recognized factor in the reluctance of young physicians to set up practice in rural areas is the lack of hospital and consultative facilities. Offsetting this, the Hill-Burton Hospital and Construction Act has been helping to equalize the distribution of both medical facilities and personnel in Michigan. Of the 53 projects approved by Jan. 31, 1954, 35 are already in operation; 28 of these are new constructions, and the remainder are projects expanding present facilities. The majority of the projects are located in rural and semirural areas and serve to attract physicians to these areas.

HISTORY OF PHYSICIANS PLACEMENT PROGRAM

The history of the placement service of the state of Michigan is unique in that the Michigan State Medical Society, which maintained a placement bureau for several years, relinquished the program in 1952 to the state-wide health council that it had helped organize. The society endeavored to assist physicians in selecting a location and to aid communities in need of medical services until its offices became overburdened by the many activities in which it was engaged and its placement bureau could no longer meet the growing demands for help. The society had helped organize the Michigan Health Council in 1943 and had been its strongest supporter; by 1952, the council had achieved prominence by its services to the people of Michigan and was still strongly supported by the medical society, as well as by many other state-wide health organizations. Under the expanded activities program that this council launched in 1949, membership was increased from the original four organizations that founded it (the medical society, the Michigan Hospital Association, the Blue Cross Plan, and the Blue Shield Plan) until there are now 31 state-wide health organizations working cooperatively in the council; its scope of activities in the field of health also has been much broadened.

The health council is concerned with the health problems of the entire state, and its program is closely coordinated with that of the medical profession. Realizing that rendering aid to communities and investigating their medical needs would increase the council's service to the people of Michigan and to the physician, the House of Delegates of the Michigan State Medical Society officially turned the program over to the council in December, 1952.

FORMATION OF PRESENT PLACEMENT SERVICE

When the Michigan Health Council assumed this responsibility, it defined these as the objectives of the placement service: (1) to find suitable locations for doctors of medicine, and (2) to assist communities in obtaining doctors of medicine for areas where their services are needed. Both objectives are in firm accord with the health council's primary responsibility to the people of the state. To embark upon a program of such consequence, the placement service had to organize office procedures, plan state-wide surveys, and give wide publicity to its activities. The executive secretary of the health council, Mr. Eugene Wiard, set about developing files, systems, and controls that would facilitate expansion as demands upon the service increased. The placement services of other states and of the American Medical Association were consulted to obtain the most effective and efficient questionnaire forms and procedures; a state-wide survey was conducted to gain a clear picture of the areas in which a need for more medical personnel existed. Letters were sent to all communities that had previously requested aid from either the state society or the A. M. A.; each community was requested to verify the existing data on locations open to physicians, as included in the letter, and to state whether the need for such medical personnel still existed.

In the survey conducted to gain an appraisal of the existing need from the viewpoint of the practitioners of medicine in each area, the secretary of each county medical society received a questionnaire on which to list the name of each town not having enough physicians and the names of persons to contact in the communities listed. Subsequently, each of these communities received a questionnaire from the placement service, designed to collect information about the community.

After gaining a clear picture of the actual needs of the state, the service began its publicity program. To ensure that doctors interested in Michigan would know about the service, the medical schools and teaching hospitals in the state and the Veterans Advisory Commission of the Selective Service were contacted. To all students, residents, and interns an especially prepared "fact sheet" was sent, which described the service offered and invited them to use it. The Veterans Advisory Commission agreed to notify the placement service of all medical officers who were about to be discharged and of any community about to lose a doctor to the armed forces. Many other medical and health organizations were also notified of the service and invited to use it. The publicity campaign to inform the people of Michigan of the aid now available to communities needing a physician began with a general press release by the president of the health council on June 4, 1953. While the needs of the state were being surveyed, more than 90 physicians seeking locations had contacted the placement service; the first physician placed was publicized in a feature article in the *Detroit Times* on June 21, 1953. On that day, this physician appeared on a half-hour television program explaining the new service. During the same week, Mr. Wiard was a guest of Michigan State College on a radio program devoted to the new service. In addition to radio, television, and newspaper publicity, the placement service has been publicized in the health council's monthly bulletin.

METHOD OF OPERATION

Although the placement program is new, routine methods of operation are very similar to those used in other states. One major difference is that, in Michigan, an attempt is made to ensure that both community and physician will continue to work through the placement office after the initial request for information has been answered. This is done by assigning a code number to each community and to each physician and utilizing these numbers, rather than names, on the descriptive rosters. The names will be sent to interested parties on request, but the particular code numbers on which further data is requested give the service a lead as to the preference and interest of the one requesting the information.

Requests from Physicians.—Due to the wide publicity, the program receives many requests from physicians seeking locations in Michigan. Each request is studied to determine whether special service is required or whether the request may be handled in the routine manner; each physician receives a carefully prepared form letter accompanied by a questionnaire, a fact sheet describing the program, and a pamphlet containing the administrative rules and regulations of the Michigan State Board of Registration in Medicine. If the physician makes any further inquiry concerning the procedure for obtaining a license to practice medicine in Michigan, his letter is immediately referred to the Board of Registration.

The questionnaire sent with the letters is designed to determine the physician's preferences as to location and type of community and to investigate his qualifications and educational background; from the questionnaires a roster is compiled that is sent on request to communities, hospitals, and others seeking a physician. When the questionnaire is returned, the physician receives a roster describing all available locations in the state; information on additional locations is sent to him periodically. When the physician has decided which communities interest him, he must contact the placement service and request the names of these communities, identifying them by their code numbers. Any number of names requested will be sent, with a letter urging the physician to contact the community directly and, if possible, to visit it. Follow-up letters are sent once or twice a month inquiring whether the physician is still seeking a location and wants to remain on the placement roster.

Follow-up on Physicians.—The Michigan Physicians Placement Service maintains a close contact with the physicians and communities on its rosters. Because of the code-number system, the service knows which communities interest the physician and can maintain cross references in order later to check whether the physician has set up practice in one of these locations without notifying the service. In addition, all correspondence with communities and physicians still on the roster is placed in a "come up" file, so that a letter will be sent within a set length of time to physicians who have not taken their names off the rosters, inquiring whether they have established practices or are still available. The placement service is also informed of the filling of these locations through a newspaper clipping service employed by the health council, through personal letters from doctors or from the contact people in the community and through personal observation by the field secretary as he tours the state. In this way, the service ensures that both physicians and community rosters are correct and up-to-date.

Requests from Communities.—In addition to direct requests for aid from committees appointed by the communities and from residents, many requests come to the placement service by referral. The state medical society, the A. M. A., all newspapers in the state, and the member organizations of the health council forward all requests for such aid to the service. The Michigan Hospital Survey and Construction Commission also consults the service frequently for assistance in staffing newly erected hospitals or increasing the staff of hospitals and clinics whose facilities have been expanded with commission aid.

For each location requesting aid, a questionnaire must be completed and returned to the placement office. This questionnaire gives data on community assets, recreational facilities, churches, availability of office and housing space, hospital facilities, and many other items that aid in evaluation of the community's desirability by the physician and of the actual need by the placement service. From this information, the description is compiled for the roster of communities.

Evaluation of Communities.—The name of the community requesting aid is referred to the secretary of the appropriate county medical society if he has not previously listed it for the placement service's appraisal of need. At present, the secretary receives a questionnaire concerning the location, as in other states, and is also requested to write a personal appraisal of the needs of the community. This is a full report of his observations as to the size of the trading area, facilities available, and other factors that cannot be adequately described in a questionnaire. His evaluation of the situation and that of the field secretary of the health council, plus the personal impression gained from reading the questionnaires returned from the community, provide an accurate means of estimating the relative need of the community and its desirability to a physician.

Because the placement service is new, most communities requesting help are listed as "openings." In Michigan, as in other states, some persons with homes to sell or office space to rent write that their community is in dire need of a physician; however, as each location is investigated, the true picture is soon uncovered. These requests are not discarded but are published in the roster as "office to rent" or "home for sale."

Advice to Communities.—As yet the placement service has not advanced to the stage at which it can help rural communities to develop programs for attracting physicians. It is, however, making plans to give such aid and is at present collecting booklets and pamphlets that may be sent out to tell such communities what has been done in other areas with a similar problem. Since this type of assistance is of great value to communities, the placement service plans an intensive campaign to show them how to attract a physician.

Other Data on Rosters.—In addition to physicians desiring to relocate and those returning from service, interns, residents, and medical students are included in the lists used by the placement service. All information from the questionnaires sent in by these physicians is summarized and published at frequent intervals. At present, the roster is revised constantly, but, when the program achieves full capacity, revisions will be completed three times annually. The roster sent to physicians, in addition to the up-to-date listing of communities that need a doctor, also includes lists of openings in the various specialty fields, openings for assistants, and institutions that need a physician's services.

Demand for Service.—The Michigan Health Council has as its objective a placement service that will fill all the state's needs for physicians as they arise and that will reach all sources of medical personnel; one year has been allowed to attain maximum operational capacity. The rapid growth of a demand is indicated by the numerous requests for aid already received by the placement service; in the first four months, 82 communities, 26 hospitals and institutions, and 61 physicians had requested aid.

OFFICE METHODS

One key to the operational efficiency of the placement service is the attention devoted to the development of a filing system readily adaptable to rapid expansion, since this is a basic element in providing the contact between physician and community. A brief outline of the system, which illustrates its simplicity and utility, follows. These are the major divisions used in the filing system at the placement service office:

1. *Physicians.*—A file folder for each physician who writes the service, on the front of which is listed each community that has requested further information concerning him and the date of the request.

2. *Communities.*—A file folder for each community, on the front of which is recorded the name of each physician who has requested further information concerning it, as a cross reference to the physician's letter.

3. *Special M.D. Contacts and Opportunities.*—Such items as office space for lease or homes, listed by area and location, to be published as "opportunities," not as locations in need.

4. *Master Rosters.*—A copy of each physician and community roster prepared, with the proper names assigned to the code numbers, in addition to rosters used in answering correspondence.

5. *File of Forms.*—A stock of all forms and questionnaires used.

6. *File of Teaching Hospitals.*—A master list of hospitals that have been contacted and are cooperating with the program, followed by folders for correspondence with the individual hospitals.

7. *American Medical Association.*—A folder for all correspondence with the A. M. A. and its Physician Placement Service.

8. *Volunteer Advisory Committee, Selective Service System.*—Lists of "priority towns," which are about to lose a physician to the armed forces, and regularly received referral lists of medical officers about to be discharged from the services.

9. *State Board of Registration in Medicine.*—A stock of pamphlets, containing "Administrative Rules and Regulations," and all correspondence except that with individual physicians.

10. *Hospital Survey and Construction.*—Correspondence on Hill-Burton projects, including those needing physicians.

11. *Reference Material.*—Samples of all educational literature to be sent to communities and physicians.

12. *Publicity Folder.*—Press releases, articles, clippings, and radio and television scripts that have featured the placement service.

13. *Meetings.*—A record of all meetings and committees concerned with the program.

14. *Miscellaneous.*—Letters of appreciation and permanent lists of physicians placed and locations filled.

15. *"Come Up" File.*—Correspondence to be referred to at a future date filed with day and month markers, of which the current matter is checked daily by the secretary.

PROGRAMS ENCOURAGING GENERAL PRACTICE

The state legislature is considering plans to increase the total enrollment of the two class-A Michigan medical schools; it is proposed that Wayne University's medical enrollment be increased from 68 to 100 and the University of Michigan's from 172 to 200. Expansion of teaching facilities has already been partially accomplished by new construction, and more buildings are proposed.

At both schools, lectures are given by outstanding physicians from rural areas in Michigan, stressing the benefits of rural practice. In addition, the University of Michigan Medical School allows interns and residents to complete their studies in qualified rural hospitals, which aids in avoiding overcrowding at the University Hospital. A decentralized resident training program, utilizing 15 affiliated hospitals, and a two year general practice training program, designed to prepare graduates to become general practitioners, are also in effect. The department of postgraduate medicine of the University of Michigan, in cooperation with Wayne University College of Medicine, the Michigan State Medical Society, and the Michigan State Department of Health, offers extension courses for local physicians on the latest developments in medicine and public health. The Michigan State Medical Society has published a brochure, "Medical Associates," encouraging young men and women to enter the fields allied with health and medicine. Such trained assistants, who can handle much of the physician's detail work, help to relieve the shortage of medical and health personnel.

COUNCIL ON NATIONAL EMERGENCY MEDICAL SERVICE

The following paper is the last of a series of six special articles dealing with the role of the individual physician in medical civil defense planning and operations.

C. JOSEPH STETLER, *Secretary.*

CIVIL DEFENSE, A PERSONAL MATTER FOR THE PHYSICIAN

Cortez F. Enloe Jr., M.D., New York

After several fake starts and the debilitating privation of a starvation budget from an uncomprehending Congress, civil defense is now about to leave adolescence for mature life as a part of our government. At many times during these formative years, the planning for the medical aspects of civil defense has been out ahead of the planning for other facets of this many-sided problem. Now, all planning has proceeded to a point at which the target cities are identified, stockpiling is in its third year, bomb effects have been carefully analyzed realistically by urban analyses, and every state medical society and an increasing number of county societies have begun to take medical civil defense seriously. In short, we now know enough of the facts to bring the medical problems of civil defense, as they will affect the individual physician, into focus. Those who have read the preceding articles, in the series of which this is the last, will have learned of many of the questions besetting medical civil defense organization. From this program of group guidance, they can acquire a better understanding of the means that they might employ to help their county and state societies.

NECESSITY OF ADVANCE PREPARATION

In concluding this series, it is time to talk of the person and time to point to the paths of thought and action that each physician must himself explore. The milieu of that exploration is illuminated by the light of three somber facts that should be recognized and accepted by everyone but especially the physician. First, no "new look" in defense is going to stop a determined enemy before some of his planes bomb our cities; second, no 20 billion dollar electronic wall is thoroughly reliable; and third, prior warning for attack vitally affects the physician's role. At present, he must expect no warning, plan for an hour's head start, and pray for a two hour alert.

Traditionally, doctors are not supposed to concern themselves with military matters. "None of our business" and "we can't do anything about it anyway" were typical of the comments once frequently heard, but, when it comes to civil defense as we now perceive it, such comments have lost their validity. Civil defense is the result of the wedding of the civilian to the military facts of life. Now everyone is a "total warrior." It is not true that one can't do anything about such defense. It is certain that, if you are a licensed physician in the United States and if this country is attacked, you will be doing something about it, and the odds are a hundred to one that, from the moment the first attack warning comes, something you're doing will be affected by the civil defense measures now planned. This holds true whether you are practicing pediatrics in Paducah or plastic surgery in Manhattan. If you want to have a say-so in your own destiny, now's the time to be active in civil defense.

The physician belongs to the most important group in the civil defense organization. No other group—not the firemen, the sanitation engineers, or the policemen—no, not even the military, can do as much to reduce the enemy's intended effect of bomb dropping. Therefore, if there is to be an attack, the physician must be prepared. And whether the attack comes without warning—and it is not a violation of security to offer even money that this is the expectancy as this is written—or whether the Air Defense Command gives the target cities two hours' notice is pertinent because it poses two entirely different problems for the physician.

Vulnerability to Attack Stressed.—It must be emphasized that the physician cannot slacken his interest in civil defense because of a false assumption of the invulnerability of our country. Every military study has shown that a determined attacker can get through. The Kelly Committee of the Department of Defense made a hard-headed examination of the "Lincoln Summer Study," which was headed by Robert Oppenheimer and Lloyd V. Berkner of Brookhaven Laboratories and which proposed an aerial Maginot line. The Kelly Committee determined, "So far as can now be foreseen, any such level of protection is unattainable and in any case completely impractical, economically and technically. . . ." So, absolute protection is out of the question. Indeed, the arrogant display of the new Russian 4 jet Tubolev bomber, like our Boeing B52, on May Day over the Kremlin is a fitting reply to those here at home who are Maginot-minded. That the physician must not be. The best to be hoped for is adequate warning time. If there is sufficient warning preceding attack, the casualties can be greatly reduced. More physicians will be available locally to administer treatment, making it necessary for fewer doctors to be uprooted from their practices in distant areas, even distant states.

DISPOSITION OF DOCTORS IN EVENT OF DISASTER

The direction of all thought concerning the role of the individual physician turns on the crucial question of the length of the warning period. For the physician with an office in any one of the 92 target cities, the length of warning means life itself. Urban analyses made by the Federal Civil Defense Administration show that, if a bomb of medium intensity is dropped on one of these cities during daytime business hours, one out of two physicians would be killed by the initial blast in most cities. In addition, a great number of hospitals would also be in the area of total destruction. In such a case, care for the surviving injured would fall upon the remnants of the local medical profession. In the event of such an enormous number of casualties, physicians would have to be brought in from other areas. Many states have made treaties that grant professional licensing reciprocity under such circumstances. Thus, it would be imprudent for any physician, in Paducah for example, to ignore the possibility that, if New York City is attacked, he might well find himself being flown into Westchester County on a few hours' notice whether he consented to such a journey or not.

Need for Hospital Facilities.—It is hoped that in such a circumstance, our pediatrician-turned-emergency-surgeon would

have a 200-bed improvised hospital in which to work. But that is no means certain, thanks to a Congress that is not awakened to the facts of civil defense life. Some of these hospitals are completely equipped, packaged, and can be set up in any sort of building that is large enough. The only trouble is that right now there are not enough of them available to take care of needs of one good-sized target city. The Federal Civil Defense Administration now only has funds for 101 improvised hospitals, although they estimate the need is in high multiples of that number. If present Air Force experiments are satisfactory, another type of hospital could supplement the 200-bed improvised type. In cooperation with the Hodges Research Corporation and the Palo Alto Clinic in California, the Air Force is studying a prototype 25-bed surgical hospital that is mobile and so completely self-contained that it can operate for 24 hours without assistance and can be flown into a disaster area in a "flying boxcar" airplane. Without these improvised hospitals or the smaller military prototype, there will be almost no assembling points where the medical profession can gather to apply their lifesaving skills. As we have seen, a goodly share of the urban hospitals will not survive the initial attack and the suburban hospitals will be swamped within an hour after a bombing. Without an improvised hospital to work in, it would be better that our mythical colleague remain in tranquil Kentucky.

Use of Physicians from Outside Target Area.—What of the man who lives and practices nearby, say in a small town 75 miles from the target area? The likelihood is good that he, too, will be herded into a bus and taken to an improvised hospital or even into the target area itself to administer emergency surgery or to perform other duties that rightfully befall a physician in disaster. However, he may be left at home to prepare for the medical care of both the well and injured who may deluge his town in 24 hours. Every physician within a hundred miles of an important city should consider this possibility when contemplating his personal role in civil defense. From the plans for various areas of the country that I have seen and from what I know of the hardening philosophy guiding this planning, it is unlikely that more than a few—in some places only one—physicians will be left behind to attend to the medical problems of such an influx.

Because there won't be enough physicians for good medical practice in the immediate disaster area, whether they are transported from miles away and no matter how long the warning, it is imperative, therefore, that the individual physician reappraise his skills in the light of the enormous demands to be thrust upon him in event of an attack. Should there be a two hour warning, it is estimated that most physicians can be removed from the target areas. This, of course, makes the picture somewhat brighter, if, indeed, there is really any bright side to this brutal reality. Such an advance warning is possible, even probable in a year or so, in the opinion of those whom we expect to know.

TRAINING FOR PEACETIME EMERGENCY

One should, however, not enter into civil defense work with the idea that the destruction of our cities by bombs or intercontinental guided missiles provides the only occasion of its usefulness. Civil defense should not exclude the possibility of other types of disaster. While the air raid is the grand tour de force among catastrophies, the possibility of applying these same plans and skills in tornadoes, floods, or fires is not to be overlooked. Acting in these disasters provides the physician with rewarding and unmatched training. It is of vital importance that civil defense preparations within urban areas, including the "prime target areas," must be made not just for the possibility of atomic attack or hydrogen bomb attack, but as well for attack with conventional explosion and incendiary bombs just as many cities were attacked during World War II and for peacetime disasters. Admittedly, in atomic attack upon an urban area, the efforts of civil defense preparations within certain areas of that city would be lost completely. This is, however, a calculated risk that must be taken, and civil defense preparations within urban areas should be made with the realization that everything from peacetime disasters to hydrogen bomb attack within the area must be anticipated insofar as civil defense preparations are concerned.

The federal government officially recognized the similarity between air raids and natural disasters when Executive Order no. 10427 was issued on Jan. 16, 1953. This order made the Federal Civil Defense Administration the government organization delegated to provide assistance to localities struck by disaster. This order served to connect every local civil defense organization in the country into a force designed to cope with the results of natural disaster. This increased responsibility is too new and too huge for it to have been discharged perfectly as yet. However, the civil defense agency did step in to aid many areas last year. Unfortunately, in only a few were physicians prepared.

Civil Defense and Natural Disasters.—The 1953 Annual Report of the Federal Civil Defense Administration, which covered disasters throughout the country, stated that in the Worcester tornado they found a well-organized civil defense operation that was "a model of Civil Defense recovery action." Waco, to the contrary, was not prepared and "as a result, [of] confusion, wasted effort, traffic congestion and delay [in rescue] . . . many died in the debris who might have been saved." Waco was not alone. In two other disasters, a similar situation prevailed because of lack of organization for such an emergency by all groups, including the medical profession. In the confusion that came in the wake of the death and destruction, the persons who grasped the initiative and emerged as leaders were not the public safety officials or, as might be hoped, the medical profession but in one case was a government mechanic and, in the other, a prostitute.

These experiences are cited because they are poignant reminders of the peacetime usefulness of a civil defense organization and because it is obvious that such an organization can operate best only if it is backed enthusiastically by every physician. Natural disaster is an incident for which every community and every physician should be prepared, for it is like an air raid on a small scale.

IMPORTANCE OF INDIVIDUAL PHYSICIAN

The ultimate success of the national civil defense program and of the programs of the American Medical Association, of the state, and of county medical societies depends, in the final analysis, not on what the authorities think and plan but on what the individual physician does. To play this role, probably the most important he has ever assumed in national life, the physician must be well informed on every aspect of medical civil defense. This each of the physicians of the country must do, for only then can he understand his complex responsibility and the forces that affect it. Such knowledge, too, will make him a better leader among his friends, his patients, and his community. The physician who, blind to this responsibility, does not inform himself of his own role in civil defense and who ignores the efforts of his colleagues in meeting this problem is failing his country, his community, and, worst of all, himself. When you come right down to it, for the physician, civil defense is a personal matter.

MEDICAL FILM REVIEWS

Air, Water, and Industry: 16 mm., color, sound, showing time 22 minutes. Produced in 1952 by and procurable on loan from the Dow Chemical Company, Midland, Mich.

This film considers the nature and origin of various common wastes and the gradual development of serious pollution as the United States has become increasingly urban and industrialized. It gives special attention to industrial pollution problems, shows what typical industries are doing to abate pollution, and utilizes the sponsor's Midland Michigan division as a case study to illustrate the geographic, research, engineering, and other factors involved in dealing with complex pollution problems. While there is some advertising in this film, it is in good taste and does not violate the concepts set up as criteria of such presentations. The film is highly recommended for medical students, schools of public health, high school and college health education classes, manufacturers' associations, service clubs, and other groups interested in community health and sanitation.

Postgraduate Continuation Courses for Physicians

Compiled by the Council on Medical Education and Hospitals for the Period July 1, 1954, to Jan. 15, 1955

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Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ADMINISTRATIVE MEDICINE			
Columbia University School of Public Health, 600 W. 168th St., New York 32	Administrative Medicine	September, 21 months, full time	$1,045.00
ALCOHOL STUDIES			
Yale University Center of Alcohol Studies, 52 Hillhouse Ave., New Haven, Conn. At: Silliman College	Summer School of Alcohol Studies	July 5, 4 weeks, full time	250.00
ALLERGY			
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Allergy and Related Conditions	Sept. 22, 10 days, part time	125.00
	Personal Course in Allery	Arranged, 1 month, full time	200.00
	Personal Course in Allery	Arranged, 6 months, full time	500.00
Hansel Foundation, 634 N. Grand Blvd., St. Louis 3 At: Sheraton Hotel	Allergy in Otolaryngology	June 7, 5 days, full time	150.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1] At: Beth-El Hospital	Allergy	October, 10 weeks, part time	30.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Montefiore Hospital	Medicine PM 68 Allergy	Sept. 16-Dec. 16, part time	50.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Allergy	Arranged, 2 months, part time	50.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Allergy	Arranged, twice weekly, part time	50.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	5415-A Allergy	Nov. 1-19, full time	200.00
Albert Einstein Medical Center, York and Tabor Rds., Philadelphia 41	Clinical Allergy	October, 2 weeks, part time	75.00
ANATOMY			
Medical College of Alabama, Birmingham	Anatomy 300, 301, 302, 303	Arranged, weekly, part time	[61]
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Surgical Anatomy: Demonstration and Lectures	Oct. 6-May 11, once weekly, part time	100.00
	Surgical Anatomy: Demonstration and Lectures	May 16-June 8, twice weekly, part time	100.00
	Surgical Anatomy: Dissection, Demonstration, and Lectures	Oct. 4-June 8, part time	250.00
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24	Surgical Anatomy	September, 10 days, once weekly, part time	75.00
Mercy Hospital, Hillcrest Dr., San Diego 3, Calif.	Surgical Anatomy	Arranged, weekly, part time	None
San Diego County General and Mercy Hospital, San Diego, Calif.	Anatomy [62]	Sept. 2-Dec. 16, part time	None
University of Ottawa Faculty of Medicine, Ottawa, Ontario, Canada	Surgical Anatomy	Arranged, 18 days, part time	10.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Surgery and Anatomy of the Extremities on the Cadaver	Sept. 22, 10 days, part time	125.00
State University of Iowa College of Medicine, Iowa City	Anatomy	Arranged, weekly, one day, part time	Not given
	Advanced Human Anatomy	Arranged, part time	None
University of Maryland School of Medicine, 29 S. Greene St., Baltimore 1	General Anatomy [63]	Arranged, full or part time	Arranged
	Surgical Anatomy [63]	January, 15 weeks, part time	150.00
	Anatomy of Head and Neck as Applied to Eye, Ear, Nose, and Throat	October, 4 months, part time	150.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Anatomy of the Thorax	Arranged, 100 hours, part time	150.00
	Anatomy of the Abdomen	Arranged, 100 hours, part time	150.00
	Applied Anatomy for the General Surgeon	Arranged, 250 hours, part time	375.00
	Applied Anatomy for the Otolaryngologist	Arranged, 150 hours, part time	275.00
	Applied Anatomy of the Urogenital System	Arranged, 130 hours, part time	300.00
	Applied Anatomy for the Anesthetist	Arranged, 125 hours, part time	275.00
	Anatomy for the Oorthopedic Surgeon	Arranged, 100 hours, part time	150.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	ANATOMY—Continued		
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Anatomy	Arranged, 18 hours, part time	$300.00
	Surgical Anatomy	Arranged, 12 hours, part time	200.00
	Operative Surgery	Arranged, 18 hours, part time	300.00
	Regional Anatomy	Arranged, 6 hours, part time	150.00
	Surgical Anatomy	Arranged, 2 weeks, part time	150.00
	Dissections, Demonstrations, and Lectures	Arranged, part time	200.00
	Surgical Anatomy	Arranged, part time	200.00
	Head and Neck Dissection	Arranged, 6 weeks, part time	150.00
	Surgical Anatomy of Nose and Accessory Sinuses	Arranged, 6 weeks, part time	150.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	411-A Anatomy of the Head and Neck	Sept. 27-Dec. 17, part time	90.00
	412-A Anatomy of the Thorax and Its Viscera	Sept. 27-Dec. 17, part time	90.00
	413-A Anatomy of the Abdomen	Sept. 27-Dec. 17, part time	90.00
Western Reserve University School of Medicine, 2109 Adelbert Rd., Cleveland 6	Anatomy 11-G	Oct. 1, 2-6 months, part time	75.00 per month
	ANESTHESIOLOGY		
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Anesthesiology	Every 2 months, 4 months, full time	300.00
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24			
At: Veterans Administration Hospital, Los Angeles 25	Anesthesiology	Nov. 4-5, full time	60.00
At: Palm Springs, Calif.	Obstetrical Anesthesia [64]	Fall, 3 days, full time	17.50
At: San Diego, Calif.	Problems in Anesthesia [65]	July or August, 3 days, full time	17.50
University of Southern California School of Medicine, 2025 Zonal Ave., Los Angeles 33			
At: Los Angeles County Hospital	892 Anesthesia	Arranged, 12 weeks, full time	300.00
St. Francis Hospital, 114 Woodland St., Hartford 5, Conn.	Anesthesia—General and Regional	July 1, 1 month, full time	Not given
American Society of Anesthesiologists, Inc., 188 W. Randolph St., Chicago			
At: Netherland Plaza Hotel, Cincinnati	Refresher Courses	Oct. 28, 2 days, full time	[66]
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Practical Course in Endotracheal Anesthesia	Arranged, 2 weeks, full time	150.00
	Practical Course in Spinal, Regional and Intravenous Anesthesia	Arranged, 2 weeks, full time	150.00
	Practical Course in Ether, Nitrous Oxide, Ethylene and Cyclopropane Anesthesia	Arranged, 1 month, full time	200.00
	Nitrous Oxide and Ether Anesthesia	Arranged, 1 month, part time	125.00
University of Minnesota Center for Continuation Study, Minneapolis 14	Anesthesiology for General Physicians	Oct. 14, 3 days, full time	25.00
University of Buffalo School of Medicine, 3435 Main St., Buffalo 14	Anesthesia	Nov. 8, 1 week, full time	50.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Clinical Anesthesiology	Arranged, 3 months, full time	200.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Applied Anesthesiology	October, 3 months, full time	300.00
	Anesthetic Technic	October, 1 week, full time	100.00
	Regional and Spinal Anesthesiology	October, 2 weeks, full time	150.00
New York State Society of Anesthesiologists, 137 W. 11th St., New York 11			
At: Various hospitals	Postgraduate Training in Anesthesiology	Arranged, part time	None
New York University Post-Graduate Medical School, 477 First Ave., New York 16	512-A Regional Anesthesiology	Sept. 7-18, full time	200.00
	513-A Anesthesiology	Arranged, 1 year, full time	700.00
	514-A Anesthesiology	Sept. 20-Dec. 10, full time	300.00
	515-A Electrocardiography for Anesthesiologists	Oct. 11-15, full time	75.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25			
At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple, Texas	Anesthesiology	September-May, 1 month, full time	25.00
	ARTHRITIS		
Emory University School of Medicine, 69 Butler St., S.E., Atlanta 3, Ga.	Arthritis	Feb. 3, full time	5.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Arthritis and Allied Rheumatic Diseases	Sept. 24, 10 days, part time	100.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Arthritis	Arranged, 8 weeks, part time	50.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	5414-A Arthritis and Allied Rheumatic Disorders	Nov. 8-12, full time	75.00
D. T. Watson School of Physiatrics, Leetsdale, Pa.[2]	Protective Body Mechanics in Arthritis	Arranged, 5 weeks, part time	10.00
	BASIC SCIENCES		
University of Maryland School of Medicine, 29 S. Greene St., Baltimore 1	Basic Sciences as They Apply to the Practice of Medicine	October, 32 weeks, part time	50.00
University of Michigan Medical School, Ann Arbor	Basic Sciences [67]	Sept. 27, 9 months, full time	[68]
Queens County Medical Society Postgraduate Education Committee, 112-25 Queens Blvd., Forest Hills, N. Y.	Biochemistry and Physiology in Health and Disease	Arranged, 12 weeks, part time	30.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106 St., New York 29	Basic Science Course [69]	October, 9 months, full time	710.00 [70]
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Basic Medical Sciences	Sept. 27, 8 months, full time	960.00
University of Puerto Rico School of Medicine, San Juan 22	Basic Science Seminar	Arranged, 2 days, part time	None
University of South Dakota School of Medical Sciences, Vermillion	Master of Medical Sciences	July 1, 9-12 months, full time	100.00
	Master of Medical Sciences	Sept. 1, 9-12 months, full time	100.00
	Master of Medical Sciences	Feb. 1, 9-12 months, full time	100.00
	Postgraduate Basic Science Course	Sept. 1, 1 semester, full time	75.00
	CARDIOVASCULAR DISEASE		
Los Angeles County Heart Association, 216 S. Bonnie Brae St., Los Angeles 57			
At: Approved hospital clinics in Los Angeles County	Postgraduate Preceptorships in Cardiology for the General Practitioner	Arranged, 12 sessions, part time	15.00
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24	Congenital Heart Disease	Nov. 17-19, full time	Not given [71]
University of Southern California School of Medicine, 2025 Zonal Ave., Los Angeles 33			
At: Los Angeles County Hospital	Cardiology and Vascular Disease [72]	July, 1 year, full time	1,000.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
CARDIOVASCULAR DISEASE—Continued			
San Diego County Heart Association, 1651 Fouth Ave., San Diego 1, Calif. At: U. S. Naval Hospital	Postgraduate Symposium on Heart Disease	October, 1 day, full time	$ 2.50
University of Colorado School of Medicine, 4200 E. Ninth Ave., Denver [3]	Clinical Electrocardiography and Recent Advances in Cardiovascular Disease	Nov. 8, 6 days, full time	[78]
Walter Reed Army Hospital, Washington 12, D. C.[4]	Recent Advances in Cardiovascular Diseases with Emphasis on Their Military Significance	Sept. 20, 4½ days, full time	None
Emory University School of Medicine, 69 Butler St., S.E., Atlanta, 3, Ga.[2]	Cardiovascular Disease	Nov. 4, full time	5.00
Harvard Medical School, Courses for Graduates, 25 Shattuck St., Boston 15			
At: Peter Bent Brigham Hospital	Clinical Heart Disease	July 1, 1 month, full time	205.00
At: Boston City Hospital	Cardiology 2	Nov. 3, 12 weeks, part time	80.00
At: Beth Israel Hospital	Cardiology 1	Jan. 24, 3½ months, full time	505.00
At: Massachusetts General Hospital	Cardiovascular Disease	Oct. 1, 1 year, full time	800.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16			
At: Jewish Sanitarium and Hospital for Chronic Diseases	Advances in Cardiology and Electrocardiography	October, 10 weeks, part time	30.00
	Clinical Ballistocardiography	October, 8 weeks, part time	20.00
St. Francis Hospital and Sanatorium for Cardiac Children, Roslyn, Long Island, N. Y.	Pediatric Cardiology	October, 8 months, part time	20.00
American Heart Association, 44 E. 23rd St., New York 10 At: Washington, D. C.	Second World Congress of Cardiology and 27th Annual Scientific Sessions	Sept. 12, 1 week, full time	Not given
At: Cleveland	Meeting of Council of High Blood Pressure Research	Oct. 22, 2 days, full time	Not given
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Montefiore Hospital, East Gun Hill Rd., New York 67	Medicine PM 60 Cardiology I	Sept. 23-June 2, part time	300.00
	Medicine PM 64 Recent Advances in Diagnosis and Surgical Treatment of Heart Diseases	Sept. 20-Jan. 24, part time Jan. 31-May 23, part time	150.00 150.00
	Medicine PM 63 Cardiology III	Sept. 21-Jan. 25, part time	200.00
	Medicine PM 63 Cardiology III	Feb. 1-May 31, part time	200.00
	Medicine PM 62 Cardiology II	Sept. 21-Jan. 25, part time	150.00
	Medicine PM 62 Cardiology II	Feb. 1-May 31, part time	150.00
At: Mount Sinai Hospital	Medicine PM 29 Clinical Cardiology	Oct. 26-Dec. 28, part time	45.00
	Medicine PM 31 Cardiovascular Diseases [5]	Nov. 1-12, full time	140.00
	Medicine PM 31 Cardiovascular Diseases [5]	Jan. 31-Feb. 11, full time	140.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Cardiology	September-May, once weekly, 20 weeks	150.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Diagnosis and Treatment of Diseases of the Heart	Arranged, 3 weeks, part time	75.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	5431-A Modern Concepts in the Etiology, Diagnosis and Treatment of Heart Diseases	Jan. 10-14, full time	50.00
	5427-A Auscultation of the Heart	Oct. 4-6, full time	50.00
	5427-A Auscultation of the Heart	Jan. 31-Feb. 2, full time	50.00
Western Reserve University School of Medicine, 2109 Adelbert Rd., Cleveland 6 [6]	Cardiac Resuscitation Course	Aug. 20-21, full time	[74]
	Cardiac Resuscitation Course	Sept. 17-18, full time	[74]
	Cardiac Resuscitation Course	Oct. 22-23, full time	[74]
	Cardiac Resuscitation Course	Nov. 19-20, full time	[74]
	Cardiac Resuscitation Course	Dec. 17-18, full time	[74]
American College of Physicians, 4200 Pine St., Philadelphia At: Michael Reese Hospital, Chicago	Cardiology	Arranged, 5 days, full time	[76]
At: Mount Sinai Hospital, New York	New Developments in Cardiovascular Disease	Oct. 11, 5 days, full time	[76]
Hahnemann Medical College and Hospital, 230 N. Broad St., Philadelphia 2	Postgraduate Cardiology Course	October, 30 weeks, part time	150.00
	Advanced Postgraduate Cardiology Course	October, 30 weeks, part time	150.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Cardiology [7]	Sept. 27, 8 months, full time	960.00
	Electroencephalography	Arranged, 2 weeks, full time	200.00
At: Philadelphia General Hospital	Graphic Methods of Cardiac Diagnosis [8]	Jan. 13-March 17, part time	50.00
	Newer Diagnostic Aids in the Diagnosis of Heart Diseases [9]	May, ½ day, part time	None
Starlight Plan for Postgraduate Study, Wayne County, Starlight, Pa.	Hypertension and Cardiovascular Diseases	August, 5 days, part time	75.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25	Cardiology	Dec. 6, 5 days, full time	Not given
At: Providence Memorial Hospital, El Paso, Texas	Seminar in Cardiology	June 13, 1 day, full time	Not given
COMMUNICABLE DISEASES			
University of Minnesota Center for Continuation Study, Minneapolis 14	Infectious Diseases for General Physicians	Nov. 18, 3 days, full time	25.00
DERMATOLOGY AND SYPHILOLOGY			
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Dermatology	Jan. 5-March 23, part time	40.00
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24 At: Veterans Administration Hospital, Los Angeles 25	Dermatology in General Practice	November-December, 6 weeks, part time	30.00
University of Southern California School of Medicine, 2025 Zonal Ave., Los Angeles 33 At: Los Angeles County Hospital	860 Dermatology and Syphilology [77]	Fall, 1 year	1,000.00
University of Colorado School of Medicine, 4200 E. Ninth Ave., Denver 20 [10]	Refresher Course—Common Skin Conditions for General Practitioners	July 16, 2 days, full time	25.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Clinical Refresher Course in Dermatology	Arranged, 2 weeks, full time	75.00
	Clinical Refresher Course in Dermatology	Arranged, 4 weeks, full time	125.00
	Dermatology	Sept. 23, 10 days, part time	100.00
	Intensive Course in Dermatology	Oct. 18, 2 weeks, full time	100.00
	Clinical Course in Dermatology	Arranged, 1 year, full time	1,000.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
DERMATOLOGY AND SYPHILOLOGY—Continued			
Maryland Academy of General Practice, 1211 Cathedral St., Baltimore 1 [11] At: University of Maryland School of Medicine	Clinical Course in Dermatology	January, 4 weeks, full time	None
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: Massachusetts General Hospital	Dermatology and Syphilology	Oct. 1, 1 year, full time	$805.00
Wayne University College of Medicine, 1401 Rivard St., Detroit At: Receiving Hospital	Seminar in Dermatology	Sept. 13, 11 weeks, part time	15.00
	Seminar in Dermatology	Dec. 6, 11 weeks, part time	15.00
	Dermopathology Seminar	Sept. 13, 11 weeks, part time	15.00
	Dermopathology Seminar	Dec. 6, 11 weeks, part time	15.00
University of Minnesota Center for Continuation Study, Minneapolis 14	Dermatology for Specialists	Oct. 28, 3 days, full time	25.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 At: Beth-El Hospital	Diagnosis and Treatment of Common Skin Disorders	October, 8 weeks, part time	20.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Columbia Presbyterian Medical Center	Dermatology GM 1 Clinical Dermatology	Arranged, 6 months, full time	230.00
	Dermatology GM 1 Clinical Dermatology	Arranged, 12 months, full time	460.00
	Dermatology GM 1-A Advanced Dermatology	Arranged, 6 months, full time	230.00
	Dermatology GM 1-A Advanced Dermatology	Arranged, 12 months, full time	460.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Dermatology and Syphilology for the General Practitioner (Seminar)	Arranged, 5 days, part time	75.00
	Dermatology and Syphilology for Specialists (Seminar)	Arranged, 5 days, part time	75.00
	Dermatologic Histopathology (Seminar)	Arranged, 5 days, part time	75.00
	Training for Specialization in Dermatology and Syphilology	Arranged, 3 years, full time	1,000.00
New York University Post-Graduate Medical School, 477 First Ave., New York	521-A A Comprehensive Review in Dermatological Histopathology	Sept. 20-23, full time	75.00
	524-A Dermatology and Syphilology [77]	Sept. 20-24, full time	75.00
	525-A Dermatology and Syphilology	July 1, 1 year, full time	700.00
	525-A Dermatology and Syphilology	Oct. 1, 1 year, full time	700.00
	525-B Dermatology and Syphilology [78]	July 1, 1 year, full time	400.00
	525-B Dermatology and Syphilology [78]	Oct. 1, 1 year, full time	400.00
	525-C Dermatology and Syphilology [79]	July 1, 1 year, full time	200.00
	525-C Dermatology and Syphilology [79]	Oct. 1, 1 year, full time	200.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Dermatology	Sept. 27, 8 months, full time	960.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25 At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Dermatology and Syphilology	Arranged, 2 weeks, full time	25.00
DIABETES			
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	General Management of Diabetes Mellitus	Oct. 7-Dec. 16, part time	60.00
Emory University School of Medicine, 69 Butler St. S. E., Atlanta, Ga.[12]	Diabetes	March 3, full time	5.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: New England Deaconess Hospital	Diabetes in Relation to General Medicine	July 12, 3 days, full time	35.00
Clifton Springs Sanitarium and Clinic, Clifton Springs, N. Y.[13]	Management of Diabetes Mellitus	Fall, 1 day, full time	None
American Diabetes Association, Inc., 1 E. 45th St., New York 17 At: Lankenau Hospital, Philadelphia	Diabetes and Basic Metabolic Problems	Jan. 19, 3 days, full time	[80]
New York University Post-Graduate Medical School, 477 First Ave., New York 16	5422-A Diabetes Mellitus, Hyperinsulinism and Hypoglycemia	Nov. 15-17, full time	35.00
ELECTROCARDIOGRAPHY			
Los Angeles County Medical Association, 1925 Wilshire Blvd., Los Angeles At: St. Joseph's Hospital, Burbank, Calif.	Interpretation of Electrocardiograms	Arranged, 1 day, part time	None
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24	Electrocardiography	Fall, 6 weeks, part time	Not given
Mount Sinai Hospital of Greater Miami, 4300 Alton Rd., Miami Beach, Fla.	ECG I Introduction to Clinical Electrocardiography	Oct. 11, 24 days, part time	25.00
	ECG II Interpretation of the Electrocardiagram	Oct. 12, 20 days, part time	30.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Intensive Course in Electrocargiography and Heart Disease	July 12, 2 weeks, full time	150.00
	Intensive Course in Electrocargiography and Heart Disease	Oct. 11, 2 weeks, full time	150.00
	Electrocardiography and Heart Disease	Sept. 22, 10 days, part time	150.00
Michael Reese Hospital, 29th St. and Ellis Ave., Chicago 16	Electrocardiographic Interpretation	Aug. 2, 2 weeks, full time	150.00
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Special ECG	Oct. 8-Dec. 17, part time	25.00
	Electrocardiography	Nov. 29, 2 weeks, full time	100.00
Beth Israel Hospital, Boston	Practical Electrocardiography, Course A	Nov. 1, 5 days, full time	100.00
	Practical Electrocardiography, Course B	Dec. 8, 10 weeks, part time	100.00
New England Medical Center, 171 Harrison Ave., Boston [14]	Electrocardiography I	Nov. 29, 5 days, full time	45.00
Wayne University College of Medicine, 1401 Rivard St., Detroit	Electrocardiography	Sept. 13, 36 weeks, part time	45.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 At: Beth-El Hospital	Basic Electrocardiography	October, 6 weeks, part time	20.00
At: Jewish Hospital	Electrocardiography for the General Practitioner [1]	October, 6 weeks, part time	30.00
At: Coney Island Hospital	The Interpretation of the Electrocardiogram	October, 10 weeks, part time	20.00

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Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
ELECTROCARDIOGRAPHY—Continued			
University of Buffalo School of Medicine, 3435 Main St., Buffalo 14	Electrocardiography in Clinical Practice	Sept. 23-Nov. 4, part time	$ 50.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Mount Sinai Hospital	Medicine PM 41 Intensive Course in Elementary Electrocardiography [5]	Oct. 18-23, full time	60.00
	Medicine PM 41 Intensive Course in Elementary Electrocardiography [5]	Jan. 17-22, full time	60.00
	Medicine PM 42 Intensive Course in Advanced Electrocardiography	Oct. 25-30, full time	60.00
	Medicine PM 42 Intensive Course in Advanced Electrocardiography	Jan. 24-29, full time	60.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Electrocardiography	Fall, 2 weeks, part time	100.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Electrocardiographic Interpretation	Arranged, 2 weeks, part time	75.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	5423-A Electrocardiography	Nov. 15-19, full time	75.00
State University of New York College of Medicine, 766 Irving Ave., Syracuse 10, N. Y. At: University Hospital of the Good Shepherd	Postgraduate Course in Basic Electrocardiography	Fall, 8 sessions, part time	15.00
Medical Advancement Trust of the Maumee Valley Hospital, 2025 Arlington Ave., Toledo, Ohio At: Academy of Medicine of Toledo and Lucas County, 3101 Collingwood Ave., Toledo	Electrocardiography	Aug. 2, 10 days, part time	None
Albert Einstein Medical Center, York and Tabor Rds., Philadelphia 41	Cardiology and Electrocardiography	October, 30 weeks, part time	100.00
University of Pennsylvania Graduate School of Medicine, 18th and Lombard Sts., Philadelphia 3 At: Philadelphia General Hospital	Recent Advances in Electrocardiography [9]	May 12, part time	Not given
	Heart Sounds and Murmurs [9]	May 12, part time	Not given
John Gaston Hospital, 860 Madison Ave., Memphis, Tenn.	Clinical Electrocardiography	Oct. 6, 3 days, full time	50.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25 At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Electrocardiology	Arranged, 2 weeks, full time	25.00
ENDOCRINOLOGY			
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24 At: San Diego, Calif.	Endocrinology [65]	July or August, 3 days, full time	17.50
University of California School of Medicine, Medical Extension Center, San Francisco 22	Symposium on Endocrine Diseases and Geriatrics	Dec. 2, 3 days, full time	Not given
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: New England Deaconess Hospital	Endocrinology in Relation to General Medicine	July 12, 3 days, full time	35.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1] At: Jewish Hospital	Medical and Gynecologic Endocrinology	October, 10 weeks, part time	20.00
At: Maimonides Hospital	Metabolic Endocrinology	October, 12 weeks, part time	30.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Endocrinology	Fall, 2 weeks, part time	100.00
ENDOSCOPY			
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Clinical Bronchoscopy	Arranged, 1 week, full time	100.00
	Clinical Bronchoscopy	Sept. 22, 8 days, part time	150.00
University of Illinois College of Medicine, 1853 W. Polk St., Chicago 12	Bronchoesophagology	October, 2 weeks, full time	150.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Columbia Presbyterian Medical Center	Otolaryngology PM 1 Bronchoscopy	Oct. 4-22, part time	250.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Gastroscopy	Arranged, 2 weeks, part time	200.00
	Gastroscopy (Advanced)	Arranged, 5 weeks, part time	200.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Bronchoscopy	Arranged, 4 weeks, part time	150.00
Temple University School of Medicine, 3400 N. Broad St., Philadelphia 40	Bronchoesophagology	Nov. 1, 2 weeks, full time	250.00
FRACTURES			
University of California School of Medicine, Medical Extension, Medical Center, San Francisco 22 At: San Francisco County Hospital and Shriners' Hospital	Conference on Fractures and Diseases of the Bone	Sept. 20, 4 days, full time	Not given
American Fracture Association, 610 Griesheim Bldg., Bloomington, Ill. At: Houston, Texas	Care and Treatment of Fractures and Associated Orthopedic Problems	Oct. 11, 1 week, full time	15.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Intensive Course in Fractures and Traumatic Surgery	Oct. 25, 2 weeks, full time	150.00
	Clinical Course in Fractures	Arranged, 1 week or more, full time	50.00
	Fractures	Sept. 22, 10 days, part time	125.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: Massachusetts General Hospital	Treatment of Fractures and Other Traumatic Conditions	Nov. 8, 6 days, full time	155.00
University of Minnesota Center for Continuation Study, Minneapolis 14	Fractures for General Physicians	Nov. 22, 3 days, full time	25.00
John Gaston Hospital, 860 Madison Ave., Memphis, Tenn.	Management of Simple Fractures	Sept. 15, 3 days, full time	50.00
FORENSIC MEDICINE			
New York University Post-Graduate Medical School, 477 First Ave., New York 16	531-A Forensic Medicine	Sept. 27, 1 year, full time	700.00

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Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	GASTROENTEROLOGY		
University of Southern California School of Medicine, 2025 Zonal Ave., Los Angeles 33 At: Los Angeles County Hospital	844 Gastroenterology	September, 1 year, full time	$1,000.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Gastroenterology	Oct. 25, 2 weeks, full time	100.00
	Gastroscopy and Gastroenterology	Nov. 8, 2 weeks, full time	200.00
	Advanced Course in Gastroscopy and Gastroenterology	Sept. 13, 1 week, full time	150.00
	Gastroenterology	Sept. 22, 10 days, part time	100.00
Wayne University College of Medicine, 1401 Rivard St., Detroit At: Receiving Hospital	Gastroenterology Clinic	Sept. 13, 11 weeks, part time	15.00
	Gastroenterology Clinic	Dec. 6, 11 weeks, part time	15.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1] At: Greenpoint Hospital	Gastroenterology	October, 7 weeks, part time	20.00
At: Jewish Hospital	Gastroenterology	October, 5 weeks, part time	20.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Montefiore Hospital	Medicine PM 73 Advanced Gastroenterology	Jan. 18-May 10, part time	75.00
	Medicine PM 70 Gastroenterology	Sept. 14-Dec. 28, part time	75.00
National Gastroenterological Association, 33 W. 60th St., New York 23 At: The Shoreham and Walter Reed Army Hospital, Washington, D. C.	Postgraduate Gastroenterology	Oct. 28, 3 days, full time	[81]
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Gastroenterology	Fall, 1 month, part time	100.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Clinical Gastroenterology	Arranged, 6 weeks, part time	75.00
	Clinical Gastroenterology	October, 6 weeks, part time	100.00
Medical Society of the State of Pennsylvania, Commission on Graduate Education, 230 State St., Harrisburg At: Erie, Allentown, Wilkes-Barre, Williamsport, Harrisburg, Johnstown, and Pittsburgh	Gastroenterology	Fall, 5 days, full time	35.00
American College of Physicians, 4200 Pine St., Philadelphia At: University of Pennsylvania Graduate School of Medicine	Gastroenterology	Nov. 15, 5 days, full time	[75]
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Gastroenterology	Sept. 27, 8 months, full time	960.00
Starlight Plan for Postgraduate Study, Wayne County, Starlight, Pa.	Diseases of the Gastrointestinal System	July, 5 days, full time	75.00 [82]
	HEMATOLOGY		
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Hematology	Arranged, 1 week, part time	100.00
Michael Reese Hospital, Ellis Ave. and 29th St., Chicago 16	Hematological Diagnosis	July 10, 2 weeks, full time	150.00
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Clinical Hematology	March 23, 3 days, full time	25.00
Maryland Academy of General Practice, 1211 Cathedral St., Baltimore [11] At: University of Maryland and Johns Hopkins Hospital	Hematology	February, 4 weeks, full time	None
Wayne University College of Medicine, 1401 Rivard St., Detroit At: Receiving Hospital	Review of Clinical Hematology	Dec. 6, 11 weeks, part time	15.00
	Hematology Clinic	Dec. 6, 11 weeks, part time	15.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Mt. Sinai Hospital	Medicine PM 35 Hematology	Nov. 2-Dec. 21, part time	50.00
At: Montefiore Hospital	Medicine PM 67 Advanced Hematology	Sept. 21-Jan. 4, part time	75.00
	Medicine PM 67 Advanced Hematology	Feb. 8-May 24, part time	75.00
	Medicine PM 66 Clinical Hematology	Sept. 14-Jan. 18, part time	75.00
	Medicine PM 66 Clinical Hematology	Feb. 1-June 7, part time	75.00
Albert Einstein Medical Center, York and Tabor Rds., Philadelphia 41	Hematology	March, 10 weeks, part time	75.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Clinical and Laboratory Hematology	December, 6 weeks, full time	200.00
	Clinical and Laboratory Hematology	February, 6 weeks, full time	200.00
	HOSPITAL ADMINISTRATION		
Columbia University School of Public Health, 600 W. 168th St., New York 32	Master of Science in Hospital Administration	September, 21 months, full time	1,045.00
	INDUSTRIAL MEDICINE		
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Industrial Medicine	March 31, 2 days, full time	25.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	480-A Introduction to Radiological Safety	Fall, 2 weeks, full time	50.00
	481-A Industrial Medicine	Sept. 27, 1 year, full time	700.00
	482-A Industrial Hygiene	January, 15 weeks, part time	60.00
	482-B Industrial Hygiene Laboratory	January, 15 weeks, part time	60.00
Institute of Industrial Health, University of Cincinnati College of Medicine, Eden Ave., Cincinnati 19 At: Kettering Laboratory	Industrial Medicine [84]	July 1, 3 years, full time	[83]
	Industrial Medicine	July 1, 12 months, full time	400.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25 At: M. D. Anderson Hospital and Tumor Institute	Industrial Medicine	October 12, 6 weeks, part time	25.00
	INTERNAL MEDICINE		
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Basic Science in Internal Medicine [62]	Oct. 3-June 10, full time	800.00
	Differential Diagnosis of Internal Diseases	Jan. 4-March 29, part time	50.00
University of Southern California School of Medicine, 2025 Zonal Ave., Los Angeles 33	842 Recent Advances in Internal Medicine	Arranged, 6 weeks, part time	25.00
	842 Recent Advances in Internal Medicine	Arranged, 9 weeks, part time	37.50
	842 Recent Advances in Internal Medicine	Arranged, 12 weeks, part time	50.00
At: Los Angeles County General Hospital	830 Internal Medicine	Arranged, 1 year, full time	1,000.00
	855 Intensive Review of Internal Medicine [85]	September, 2 weeks, full time	50.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
INTERNAL MEDICINE—Continued			
Letterman Army Hospital, San Francisco	Recent Advances in Internal Medicine	Oct. 11, 5 days, full time	None
University of California School of Medicine, Medical Extension, Medical Center, San Francisco 22 At: Mills Memorial Hospital, San Mateo	Evening Lectures in Medicine—Part 1	September and October, 6 days, part time	$ 25.00
Emory University School of Medicine, 69 Butler St. S.E., Atlanta, Ga. At: Grady Memorial Hospital, 36 Butler St. S.E.	General Internal Medicine	Arranged, 2-12 weeks, full time	[86]
Chicago Medical Society, 86 E. Randolph St., Chicago 1 At: Sheraton Hotel	Basic Principles and Recent Developments in Internal Medicine	Nov. 8, 1 week, full time	75.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Intensive Course in Internal Medicine	Sept. 27, 2 weeks, full time	125.00
	Intensive Course in Liver and Biliary Tract Diseases	Sept. 20, 1 week, full time	100.00
University of Kansas Medical Center, 39th and Rainbow Blvd., Kansas City 12, Kan.	Internal Medicine	Nov. 15, 4 days, full time	40.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: Boston City Hospital	Internal Medicine 1	Sept. 1, 1 year, full time	605.00
	Internal Medicine 2	Sept. 1, 3 months, full time	380.00
New England Medical Center, 171 Harrison Ave., Boston [14]	Review of Recent Advances in Internal Medicine	Oct. 4, 1 week, full time	55.00
Wayne University College of Medicine, 1401 Rivard St., Detroit At: Receiving Hospital	Medical Seminar	Sept. 13, 11 weeks, part time	15.00
	Medical Seminar	Dec. 6, 11 weeks, part time	15.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1] At: Kings County Hospital	Recent Advances in Internal Medicine	October, 10 weeks, part time	30.00
At: Jewish Hospital	Hypertension and Nephritis	October, 8 weeks, part time	20.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Mt. Sinai Hospital	Medicine PM 30 Present-Day Methods in Medical Practice	Nov. 15-20, full time	75.00
At: Montefiore Hospital	Medicine PM 72 Neoplastic Diseases	Sept. 14-Jan. 25, part time	150.00
	Medicine PM 72 Neoplastic Diseases	Feb. 1-May 31, part time	150.00
	Medicine PM 65 Peripheral Vascular Diseases	Sept. 23-March 31, part time	125.00
At: Columbia-Presbyterian Medical Center	Cerebral Palsy [15]	Oct. 11-29, full time	100.00
	Cerebral Palsy [15]	Feb. 7-25, full time	100.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Internal Medicine	September-June, 1 or 2 months full time	150.00 per month
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Vascular Diseases	Arranged	200.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	5432-A Recent Advances in the Diagnosis and Treatment of Common Poisoning	Dec. 6-8, full time	60.00
	5433-A Tutorial Course in Internal Medicine	July, 4-6 months, full time	100.00 per month
	5433-A Tutorial Course in Internal Medicine	September, 4-6 months, full time	100.00 per month
	5433-A Tutorial Course in Internal Medicine	January, 4-6 months, full time	100.00 per month
	5418-A Peripheral Vascular Diseases	Nov. 29-Dec. 3, full time	50.00
	5429-A Internal Medicine	July 1, 1 year, full time	700.00
	5429-A Internal Medicine	Sept. 27, 1 year, full time	700.00
State University of New York College of Medicine, 766 Irving Ave., Syracuse 10, N. Y. At: University Hospital of the Good Shepherd	Recent Advances in Internal Medicine	Fall, 8 sessions, part time	15.00
Medical Advancement Trust of the Maumee Valley Hospital, 2025 Arlington Ave., Toledo, Ohio At: Academy of Medicine of Toledo and Lucas County, 3101 Collingwood Ave.	Revaluation of the Problem of Acute Pericarditis; Problem of Refractory Heart Failure; Arteriolosclerosis—Pros and Cons in Cause and Treatments	Oct. 14, 1 day, part time	None
	Hepatitis—Its Recognition and Treatment; Chronic Diarrhea; Medicine in India	Oct. 15, 1 day, part time	None
American College of Physicians, 4200 Pine St., Philadelphia At: University of Pennsylvania Graduate School of Medicine	Physiological Basis of Internal Medicine	Arranged, 5 days, full time	[75]
At: Beth Israel Hospital, Boston	Internal Medicine	Nov. 8, 5 days, full time	[75]
At: University of Oklahoma School of Medicine	Selected Problems in Internal Medicine	Oct. 4, 5½ days, full time	[75]
At: Medical College of Virginia, Richmond	Basic Concepts in Internal Medicine	Oct. 11, 5 days, full time	[75]
At: University of Pittsburgh School of Medicine	Selected Subjects in Internal Medicine	Oct. 25, 5½ days, full time	[75]
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Internal Medicine	Sept. 27, 8 months, full time	900.00
Southwestern Medical School of the University of Texas, 2211 Oak Lawn Ave., Dallas 19	Recent Advances in Internal Medicine	Oct. 4, 5 days, full time	50.00
MALIGNANT DISEASE			
Colorado State Medical Society, 835 Republic Bldg., Denver [16] At: Shirley-Savoy Hotel	Eighth Annual Rocky Mountain Cancer Conference	July 14, 2 days, full time	None
Dade County Medical Association, 139 N.E. 1st St., Miami, Fla. At: The Cancer Institute at Miami	Cancer Cytology	Arranged, 1-12 months, full time	[87]
Wayne University College of Medicine, 1401 Rivard St., Detroit At: Yates Clinic	Cancer Detection	Sept. 13, 11 weeks, part time	25.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Columbia Presbyterian Medical Center	Cancer PM 1 Cancer Diagnosis and Treatment [5]	Nov. 15-27, full time	100.00
	Cancer PM 1 Cancer Diagnosis and Treatment [5]	April 18-30, full time	100.00
University of Oregon Medical School, 3181 S.W. Sam Jackson Park Rd., Portland 1 [17]	Diagnosis and Treatment of Malignant Growths	Sept. 20, 5 days, full time	25.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	MALIGNANT DISEASE—Continued		
American College of Physicians, 4200 Pine St., Philadelphia 4 At: Memorial Center for Cancer and Allied Diseases	Medical Aspects of Neoplastic Diseases	Oct. 18, 5 days, full time	Not given
University of Puerto Rico [18] School of Medicine, San Juan 22	Postgraduate Instruction in Cancer	Arranged, 10 weeks, part time	None
Tennessee State Medical Association, 4 S. Dunlap St., Memphis 3 [19] At: 5 teaching centers in eastern section of Tennessee	Cancer	Spring, 5 days, full time	None
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25 At: M. D. Anderson Hospital and Tumor Institute	Modern Diagnosis and Treatment of Cancer	Oct. 28, 2 days, full time	Not given
	MEDICINE, GENERAL		
Alabama Academy of General Practice, 17 Molton St., Montgomery	Seminar	Fall	Not given
John A. Andrew Memorial Hospital, Tuskegee Institute, Ala.[20]	John A. Andrew Clinical Society Clinical Conference and Scientific Meetings	April 11-16, full time	$ 10.00
Arkansas Academy of General Practice At: Lafayette Hotel, Little Rock	Fall General Practice Postgraduate Seminar [21]	Oct. 6-7, full time	10.00
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	General Medicine	Oct. 5-Dec. 21, part time	50.00
Los Angeles County Heart Association, 316 S. Bonnie Brae St., Los Angeles 57 At: Wilshire-Ebell Theatre	Annual Postgraduate Symposium	Oct. 13, 2 days, full time	15.00
Los Angeles County Medical Association, 1925 Wilshire Blvd., Los Angeles At: St. Joseph's Hospital, Burbank, Calif.	Postgraduate Breakfast Study Club	Arranged, 1 day, part time	None
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24	Annual Medical Lecture Series	September, 12 weeks, part time	50.00
At: Palm Springs, Calif.	What's New in Medicine [64]	Fall, 3 days, full time	17.50
Mercy Hospital, Hillcrest Dr., San Diego 3, Calif.[22]	Recent Medical Progress	Arranged, weekly, part time	50.00
San Diego County General Hospital, San Diego 3, Calif.	Annual Postgraduate Assembly	Sept. 15-16, full time	None
California Academy of General Practice, Penthouse, 461 Market St., San Francisco At: Hotel Statler, Los Angeles	Sixth Annual Scientific Assembly	Oct. 24-27, full time	[53]
California Medical Association, 450 Sutter St., San Francisco	Circuit Course of Lectures	Fall, 4 weeks, part time	25.00
At: Ukiah, Eureka, Woodland, and Napa	Circuit Course of Lectures	Spring, 4 weeks, part time	25.00
At: Marysville, Chico, Dunsmuire, and Auburn	Circuit Course of Lectures	Fall, 4 weeks, part time	25.00
At: Santa Rose	Circuit Course of Lectures	Spring, 4 weeks, part time	25.00
At: Santa Barbara	North Coast Counties, Medical and Surgical Institute	Jan. 1-May 1, 2 days, full time	10.00
At: Sacramento	West Coast Counties, Medical and Surgical Institute	Jan. 1-May 1, 2 days, full time	10.00
At: Fresno	Sacramento Valley Counties, Medical and Surgical Institute	Jan. 1-May 1, 2 days, full time	10.00
At: Palm Springs	San Joaquin Counties, Medical and Surgical Institute	Jan. 1-May 1, 2 days, full time	10.00
	Southern Counties, Medical and Surgical Institute	Jan. 1-May 1, 2 days, full time	10.00
University of California School of Medicine, Medical Extension, Medical Center, San Francisco 22 At: Mills Memorial Hospital, San Mateo	Evening Lectures in Medicine, Part II	November-December, 6 hours, part time	25.00
At: East Oakland Hospital, Oakland	Medicine for General Practitioners	September, 12 weeks, part time	50.00
St. John's Hospital, 1328 22nd St., Santa Monica, Calif. At: Elks' Club	St. John's Hospital Postgraduate Assembly	Sept. 13-15, full time	10.00
San Joaquin County Medical Society, American Trust Building, Stockton, Calif.	Stockton Postgraduate Study Club	Arranged, 8 weeks, part time	10.00
Children's Hospital, 1056 E. 19th Ave., Denver 18	Annual Summer Clinics	June 16, 3 days, full time	25.00
Yale School of Medicine, 333 Cedar St., New Haven, Conn.[23]	Connecticut Clinical Congress	Sept. 15, 2 days, full time	3.00
University of Delaware Extension Division, Wilmington [139]	Comprehensive General Practice Review	Sept. 8-Nov. 3, weekly, 10 weeks, part time	[140]
Emory University School of Medicine, 69 Butler St. S.E., Atlanta, Ga.[24]	General Practice	Dec. 7, 3 days, full time	15.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Diagnosis and Treatment of Medical Emergencies	Sept. 22, 10 days, part time	100.00
	General Medicine	Sept. 22, 10 days, part time	100.00
	Differential Diagnosis	Sept. 22, 10 days, part time	100.00
Illinois Academy of General Practice, 14 E. Jackson Blvd., Chicago At: Alton, Belleville, Bloomington, Champaign, Chicago, Danville, Decatur, Effingham, Elmhurst, Herrin, Joliet, Moline, Peoria, Rockford, and Geneva	Medicine for Today	October and November, 6 weeks, part time	40.00
Mississippi Valley Medical Society, 209-224 W. C. U. Bldg., Quincy, Ill. At: Hotel Sherman, Chicago	19th Annual Interstate Postgraduate Medical Assembly	Sept. 22, 3 days, full time	None
University of Kansas Medical Center, 39th and Rainbow Blvd., Kansas City 12 At: Eight selected centers in Kansas	General Practice Postgraduate Course [25]	October, 7 months, part time	20.00
Lahey Clinic, 605 Commonwealth Ave., Boston 15	Six Months Postgraduate Course [26]	December, 6 months, part time	25.00
Massachusetts Medical Society, 22 Fenway, Boston 15	Lahey Clinic Postgraduate Assembly	Sept. 9-11, 3 days, full time	20.00
Postgraduate Medical Institute, 22 The Fenway, Boston At: Boston, New Bedford, Fall River, Fitchburg, Holyoke, Pittsfield, and Weymouth	New England Postgraduate Assembly	Oct. 25-27, 3 days, full time	Not given
Massachusetts Academy of General Practice, 1107 Washington St., Dorchester	Medical Subjects	Arranged, 10 sessions, part time	Not given
	Semi-Annual Clinical Meeting of the Massachusetts Academy of General Practice	Sept. 22, 1 day, full time	Not given
Kellogg Foundation, Battle Creek, Mich. At: In five centers in Ontario, Canada	Kellogg Foundation Scheme for Decentralized Courses	Arranged, 5 days during year	None
Wayne University College of Medicine, 1401 Rivard St., Detroit At: Receiving Hospital	Medical Conference	Sept. 13, 11 weeks, part time	15.00
	Medical Conference	Dec. 6, 11 weeks, part time	15.00
Mississippi Academy of General Practice, Box 1435, Jackson At: Heidelberg Hotel	Annual Assembly	September, 2 days, full time	Not given
	Seminar [27]	Dec. 9, full time	None

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Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
MEDICINE, GENERAL—Continued			
Missouri Academy of General Practice At: Governor Hotel, Jefferson City	6th Annual Assembly [28]	Oct. 27, 2 days, full time	None
Kansas City Southwest Clinical Society, 3036 Gillham Rd., Kansas City 8, Mo. At: Municipal Auditorium	Annual Fall Clinical Conference [89]	Oct. 4, 4 days, full time	$ 20.00
Montana Medical Association, 1236 N. 28th St., Billings [29] At: Billings, Glendive, Miles City, Wolf Point, Lewistown, and Havre	Healthful School Living	Nov. 15-20, 3 hours, full time	None
Nebraska State Medical Association, 1315 Sharp Bldg., Lincoln At: Alliance, McCook, Hastings, Columbus, Wayne, and Nebraska City	Fourth Annual Regional Postgraduate Courses [90]	September, 1 day, full time	Not given
Omaha Mid-West Clinical Society, 1031 Medical Arts Bldg., Omaha, Neb. At: Paxton Hotel	22d Annual Assembly	Oct. 25, 4 days, full time	7.50
Atlantic City Hospital, 26 S. Ohio St., Atlantic City, N .J.	Visiting Chief Program	Arranged, 5 days, part time	None
University of Buffalo School of Medicine, 3435 Main St., Buffalo 14	Recent Advances in Clinical Practice	Sept. 13, 1 week, full time	50.00
Lederle Laboratories, 30 Rockefeller Plaza, New York At: Heidelberg Hotel, Jackson, Miss.	Lederle Seminar	November, 1 day, full time	None
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	General Practitioner's Course	Arranged, 4 weeks, full time	100.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	740-A Comprehensive Medicine for Foreign Physicians	Sept. 27, 1 year, full time	800.00
	5430-A Review Course in General Medicine	July 12-23, full time	100.00
University of North Carolina School of Medicine, Chapel Hill [30] At: Morganton	Postgraduate Course in Medicine	September, 6 weeks, part time	20.00
Duke University School of Medicine, Durham, N. C. At: Duke Hospital	Medical Postgraduate Course	Arranged, 4 days, full time	Not given
North Carolina Academy of General Practice, 820 Nissen Bldg., Winston-Salem [31]	Scientific Seminar	October, 2 days, full time	None
Southwestern Ohio Society General Physicians and the University of Cincinnati College of Medicine, Eden and Bethesda Aves., Cincinnati 19	Seminar Series for General Physicians	Oct. 7, 14, 21, 28; Nov. 28; Jan. 23, part time	[128]
Oklahoma County Medical Society, 503 Medical Arts Bldg., Oklahoma City At: Biltmore Hotel	Oklahoma City Clinical Society	Oct. 25, 4 days, full time	[91]
University of Toronto Faculty of Medicine, Toronto 5, Ontario, Canada At: Sunnybrook Hospital	Advanced Graduate Course	Aug. 23, 6 weeks, full time	200.00
	Refresher Course Sponsored by Medical Alumni Association	Autumn, 2 days, full time	None
Jefferson Medical College and Hospital, 1025 Walnut St., Philadelphia 7 [32]	Jefferson Reunion Day Programs	June 15, 3 days, full time	None
Philadelphia County Medical Society, 301 S. 21st St., Philadelphia 3	Postgraduate Institute [90]	March 29, 4 days, full time	Not given
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Advances in Medicine and Surgery	Sept. 20, 1 week, full time	[92]
Wyeth Laboratories, Inc., 1401 Walnut St., Philadelphia 2 At: Heidelberg Hotel, Jackson, Miss.	Wyeth Seminar	Dec. 9, 1 day, full time	None
Medical College of South Carolina, 16 Lucas St., Charleston [33]	Postgraduate Seminar	Nov. 2, 3 days, full time	None
Chattanooga-Hamilton County Medical Society, Medical Arts Bldg., Chattanooga, Tenn. At: Read House	Tennessee Valley Medical Assembly	Sept. 27, 2 days, full time	15.00
Nashville Academy of Medicine, 647 Doctors Bldg., Nashville, Tenn. At: Hermitage Hotel	Nashville Medical Assembly	Oct. 28, 3 days, full time	15.00
Texas Academy of General Practice, 1410 Nickerson St., Austin At: Galveston	Annual Scientific Assembly of the Texas Academy of General Practice	Sept. 9, 3 days, full time	Not given
Postgraduate Medical Assembly of South Texas, 229 Medical Arts Bldg., Houston At: The Shamrock Hotel	Postgraduate Medical Assembly of South Texas	July 19, 3 days, full time	20.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25 At: The Methodist Hospital, Lubbock	Postgraduate Review	Oct. 6, 4 weeks, part time	15.00
Wichita County Medical Society, 1600 8th St., Wichita Falls, Texas	North Texas and Southern Oklahoma Fall Clinical Conference	Sept. 22, full time	8.00
University of Virginia School of Medicine, Charlottesville	General Medicine	November, 1 day, full time	None
Washington State Academy of General Practice, 426 Medical Center Bldg., Spokane [34] At: Winthrop Hotel, Tacoma	Scientific Assembly	Oct. 29, 2 days, full time	10.00
Interstate Postgraduate Medical Association of North America, 16 N. Carroll St., Madison, Wis.[35] At: Municipal Auditorium, Minneapolis	Interstate Postgraduate Medical Assembly	Nov. 1, 4 days, full time	5.00
Jackson Clinic and Marquette University, 16 S. Henry St., Madison, Wis. At: Methodist Hospital	Jackson Clinic Postgraduate Meeting	Fall, 1 day, part time	None
University of Wisconsin Medical School, 418 N. Randall Ave., Madison	Observation Course in Medicine	Arranged, 1-6 months, full time	100.00
MICROBIOLOGY			
Virus & Rickettsia Section, Communicable Disease Center, P. O. Box 61, Montgomery, Ala.[36]	Laboratory Diagnosis of Virus Diseases [93]	Oct. 18-29, full time	None
Communicable Disease Center, U. S. Public Health Service, Chamblee, Ga.	Laboratory Methods in Medical Mycology Part 1: Cutaneous and Pathogenic Fungi [93b]	Nov. 1, 2 weeks, full time	None
	Laboratory Methods in Medical Mycology Part 2: Subcutaneous and Systemic Fungi [93b]	Nov. 15, 2 weeks, full time	None
	Laboratory Diagnosis of Bacterial Diseases: Enteric Bacteriology [93b]	Oct. 18, 2 weeks, full time	None
	Laboratory Diagnosis of Bacterial Diseases Part 1: General Bacteriology [93b]	Sept. 13, 2 weeks, full time	None
	Laboratory Diagnosis of Bacterial Diseases Part 2: General Bacteriology [93b]	Sept. 27, 2 weeks, full time	None

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Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	MICROIOLOGY—Continued		
Maryland Academy of General Practice, 1211 Cathedral St., Baltimore 1			
At: Johns Hopkins Hospital	Water and Electrolyte Metabolism	March, 4 weeks, full time	None
Wayne University College of Medicine, 1401 Rivard St., Detroit	Seminar in Microbiology	Sept. 13, 11 weeks, part time	$ 15.00
	Seminar in Microbiology	Dec. 6, 11 weeks, part time	15.00
	Virology	Sept. 13, 11 weeks, part time	50.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Bacteriology	Arranged, 3 months, part time	100.00
	Immunology	Arranged, 6 weeks, part time	50.00
	Parasitology	Arranged, 6 weeks, part time	75.00
	NEUROLOGICAL SURGERY		
New York University Post-Graduate Medical School, 477 First Ave., New York 16	551-A The Intervertebral Disc	Oct. 4-8, full time	90.00
	552-A Diagnosis and Treatment of Peripheral Nerve Injuries	Jan. 10-14, full time	90.00
	553-A Neurosurgery	Oct. 18-23, full time	125.00
	553-A Neurosurgery	May 2-7, full time	125.00
	554-A Special Neurosurgery	Arranged, 1 year, full time	800.00
	NEUROLOGY AND PSYCHIATRY		
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24	Techniques of Hypnosis	October, 3 days, full time	Not given
At: Palm Springs, Calif.	Problems in Neurology [64]	Fall, 3 days, full time	17.50
University of Montreal Faculty of Medicine, 2900 Mount Royal Blvd., Montreal 26, Canada	Continuation Course in Neuro-Anatomy and Neuro-Physiology [94]	Fall, 30 weeks, part time	150.00
Fitzsimmons Army Hospital, Denver 8 [4]	Psychotherapeutic Medicine [95]	Aug. 23, 5½ days, full time	None
Yale University School of Medicine, 333 Cedar St., New Haven, Conn.[87]	Basic Neurology	Sept. 27, 11 weeks, part time	None
Catholic University of America, Washington 17, D. C.	Introduction to Psychiatry	Oct. 1, 4 months, part time	45.00
	Child Psychiatry	Summer, full time	45.00
	Child Psychiatry	Oct. 1, 4 months, part time	45.00
	Clinical Psychiatry	Every semester, part time	45.00
	Psychosomatic Medicine	May 5, full time	5.00
Emory University School of Medicine, 69 Butler St., S.E., Atlanta, Ga.[12]			
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Personal Course in Clinical Neurology	Sept. 22, 10 days, part time	100.00
	Personal Course in Neuropathology	Arranged	20.00 per hour
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Evaluating and Managing Emotional Problems in Practice	Oct. 8-Dec. 17, part time	50.00
Massachusetts Department of Mental Health, 15 Asburton Pl., Boston			
At: Metropolitan State Hospital, Waltham, Mass.	Review Course in Basic Neurology and Psychiatry	Oct. 4-Dec. 6, part time	None
Center for Continuation Study, University of Minnesota Medical School, Minneapolis 14	Psychiatric Principles in General Practice	Sept. 8, 3 days, full time	25.00
		Nov. 4-6, full time	25.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1]			
At: Jewish Hospital	Child Psychiatry	October, 10 weeks, part time	20.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Columbia-Presbyterian Medical Center	Psychiatry PM 1 Symposium on Neurology and Psychiatry	Oct. 4-Dec. 10, full time	250.00
	Neurology PM 2 Clinical Electroencephalography and Electromyography	Oct. 1, 3 months, full time	250.00
	Neurology PM 2 Clinical Electroencephalography and Electromyography	Jan. 3, 3 months, full time	250.00
At: Mt. Sinai Hospital	Neurology PM 31 Neuropathology	Oct. 1-Dec. 3, part time	60.00
	Neurology PM 33 Clinical Electroencephalography	Sept. 30-Jan 13, part time	60.00
At: Montefiore Hospital	Neurology PM 61 Advanced Neurology	Arranged, 3 months, full time	150.00
	Neurology PM 62 Review of Neurology	Sept. 15-Dec. 8, part time	150.00
Institute for Psychotherapy, 218 E. 70th St., New York 21	702 Review Course in Psychiatry	Sept. 13, 26 hours, part time	50.00
	701 Review Course in Neurology	Sept. 13, 86 hours, part time	150.00
	103 The Development of Psychoanalytic Thinking	Oct. 11, 15 weeks, part time	Not given
	115 Introduction to Psychotherapy and Psychotherapeutic Techniques	Oct. 13, 15 weeks, part time	Not given
	106 Techniques of Dream Interpretation	Oct. 14, 15 weeks, part time	Not given
	116 Clinical Psychiatry and Diagnosis	Oct. 14, 15 weeks, part time	Not given
	119 The Handling of Special Problems in Therapy	Dec. 22, 5 weeks, part time	Not given
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Psychiatry and Psychoanalysis	January, 12 weeks, part time	40.00
	Comprehensive Course in Psychiatry	October, 3 years, 5 nights weekly, part time	500.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	644-A Neuroanatomy and Neurophysiology	Sept. 13, 12 weeks, part time	250.00
	647-A Psychiatry and Neurology	Sept. 20, 12 weeks, full time	300.00
	649-A Psychiatry	July 1, 9 months, full time	700.00
	649-A Psychiatry	July 1, 12 months, full time	700.00
	645-A Neurology	July 1, 9 months, full time	700.00
	645-A Neurology	July 1, 12 months, full time	700.00
	642-A Electroencephalography	Arranged, weekly, part time	300.00
William Alanson White Institute of Psychiatry, Psychoanalysis and Psychology, 12 E. 86th St., New York 28	Relationships of Neurophysiology and Psychiatry	Oct. 23, 4 days, part time	15.00
	Abnormal Psychology of the Child	Sept. 30, 11 weeks, part time	35.00
	Case Seminar on the Team Work Approach in Therapy	Sept. 17, 8 sessions, part time	35.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Neurology-Psychiatry	Sept. 27, 8 months, full time	960.00
	Clinicobiologic Neurology and Psychiatry	Sept. 27, 12 weeks, full time	300.00

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Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OBSTETRICS AND GYNECOLOGY			
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Management of Infertility	Jan. 6-March 3, part time	$ 30.00
American Committee on Maternal Welfare of Academy of Obstetrics and Gynecology, 116 S. Michigan Ave., Chicago 3			
At: Palmer House	Sixth American Congress on Obstetrics and Gynecology	Dec. 13, 5 days, full time	10.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Intensive Course in Gynecology	Sept. 20, 2 days, full time	150.00
	Intensive Course in Gynecology	Oct. 18, 2 days, full time	150.00
	Vaginal Approach to Pelvic Surgery	Sept. 13, 1 week, full time	100.00
	Vaginal Approach to Pelvic Surgery	Nov. 1, 1 week, full time	100.00
	Combined Course in Gynecology and Obstetrics	Arranged, 3 weeks, full time	225.00
	Intensive Course in Obstetrics	Oct. 4, 2 weeks, full time	150.00
	Intensive Course in Obstetrics	Nov. 1, 2 weeks, full time	150.00
	Gynecologic Surgery	Sept. 1, 5 days, part time	100.00
	Gynecologic Surgery	Nov. 3, 5 days, part time	100.00
	Office Gynecology	Sept. 1, 4 days, part time	100.00
	Office Gynecology	Nov. 3, 4 days, part time	100.00
	General and Office Obstetrics	Sept. 1, 4 days, part time	100.00
	Surgical Obstetrics	Nov. 17, 4 days, part time	100.00
State University of Iowa College of Medicine, Iowa City			
At: University Hospital	Postgraduate Conference in Obstetrics and Gynecology	Fall, 1½ days, full time	10.00
University of Kansas Medical Center, 39th and Rainbow Blvd., Kansas City 12 [88]	Postgraduate Course in Obstetrics	Oct. 8, 3 days, full time	30.00
Johns Hopkins University School of Medicine, 710 N. Washington St., Baltimore			
At: Johns Hopkins Hospital	Gynecological Pathology	Oct. 1, 8 weeks, part time	150.00
	Gynecological Pathology	Dec. 1, 8 weeks, part time	150.00
	Gynecological Pathology	Feb. 1, 8 weeks, part time	150.00
University of Maryland School of Medicine, 29 S. Greene St., Baltimore 1			
At: University Hospital	Gynecology and Obstetrics	September-May, 12 weeks, full time	150.00
	Gynecology, Oncology and Female Urology	September-May, 10 weeks, full time	125.00
At: Boston Lying-In Hospital	Clinical Obstetrics	October, 1-2 months, full time	155.00
At: Free Hospital for Women, Brookline	Gynecology 2	July, 1 month, full time	20.00
	Gynecology 2	August, 1 month, full time	20.00
	Gynecology 2	September, 1 month, full time	20.00
	Pathology of Obstetrics and Gynecology	Jan. 6, 19 weeks, part time	155.00
At: Massachusetts General Hospital	Gynecology 3	Sept. 13, 2 weeks, full time	155.00
University of Minnesota Center for Continuation Study, Minneapolis 14	Obstetrics for Specialists	Dec. 2, 3 days, full time	25.00
Montana Medical Association, 1236 N. 28th St., Billings, Mont. [89]			
At: Kalispell, Missoula, Butte, Helena, Great Falls, and Bozeman	Obstetric Hemorrhage	Oct. 25-30, 3 hours, full time	None
University of Buffalo School of Medicine, 3435 Main St., Buffalo 14	Obstetrics and Gynecology	Dec. 8, 2 days, full time	25.00
Queens County Medical Society Postgraduate Education Committee, 112-25 Queens Blvd., Forest Hills, N. Y.	Gynecological Pathology	Arranged, 1 day, weekly, part time	Not given
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Mt. Sinai Hospital	Obstetrics and Gynecology PM 30 Newer Developments in Obstetrics and Gynecology	Nov. 1-19, full time	150.00
At: Margaret Hague Maternity Hospital, Jersey City, N. J.	Obstetrics PM 81 Observation Course	Arranged, 1 month, full time	100.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	General Fertility and Sterility	Arranged, 2 weeks, part time	200.00
	Advanced Course in Fallopian Tube Physiology, Diagnosis and Treatment	Arranged, 2 weeks, part time	150.00
	Advanced Course in Culdoscopy in Sterility	Arranged, 2 weeks, part time	150.00
	Advanced Course in Endometrial Biopsy and Ovulation	Arranged, 2 weeks, part time	150.00
	Advanced Course in Operative (Reparative and Restorative) Gynecology in Sterility	Arranged, 2 weeks, part time	150.00
	Advanced Course in Semen and Semen Analysis	Arranged, 1 week, part time	75.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Clinical Course in Office and General Obstetrics	Arranged, 4 weeks, part time	100.00
	Culdoscopy	Arranged, twice weekly, part time	100.00
	Clinical Gynecology	Arranged, 6 weeks, part time	75.00
	Clinical and Operative (Cadaver) Gynecology	Arranged, 6 weeks, part time	175.00
	Manikin Obstetrics	Arranged, 6 weeks, part time	100.00
	Gynecology and Obstetrics Including Manikin Obstetrics and Operative Gynecology (Cadaver)	October, 2 months, full time	250.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	560-A Diagnosis and Therapy of Malignant Neoplasms of the Female Genital Tract	Sept. 20-June 6, part time	300.00
	562-A Technique of Gynecological Examination	Oct. 25-Nov. 26, part time	75.00
	564-A Infertility	Dec. 6-8, full time	40.00
	566-A Culdoscopy	Nov. 29-Dec. 3, part time	50.00
	566-B Culdoscopy	Jan. 31-Feb. 4, part time	50.00
	566-C Culdoscopy	May 2-6, part time	50.00
	567-A Gynecology and Endocrinology	Oct. 4-9, full time	125.00
	568-A Gynecological Cytology [96]	Oct. 5-Dec. 2, part time	100.00
	734-A Gynecology [96]	Sept. 7-Dec. 24, part time	250.00
	5610-A X-Ray Diagnosis in Obstetrics and Gynecology	Nov. 15-19, full time	Not given
Southern Pediatric Seminar, Saluda, N. C.	Obstetric and Gynecology Course	July 26, 1 week, full time	25.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Gynecology-Obstetrics	Sept. 27, 8 months, full time	960.00
University of Puerto Rico School of Medicine, San Juan 22 [18]	Cytology and Cytologic Techniques in Office Gynecology	Arranged, 2 days, part time	None
Tennessee State Medical Association, 4 S. Dunlap St., Memphis			
At: 15 teaching centers in middle and east Tennessee	Circuit Course in Obstetrics	Continuously, 10 weeks, full time	20.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OBSTETRICS AND GYNECOLOGY—Continued			
Tennessee State Medical Association, 4 S. Dunlap St., Memphis 3 [40]			
At: 45 teaching centers in the state of Tennessee	Obstetrics	Sept. 21, 10 weeks in each circuit, full time	$ 20.00
Southwestern Medical School of the University of Texas, 2211 Oak Lawn Ave., Dallas 19	Obstetrics and Gynecology	Nov. 15, 3 days, full time	30.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25			
At: Scott and White Memorial Hospital, Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Obstetrics	Arranged, 2 weeks, full time	25.00
	Obstetrics and Gynecology	August, part time	Not given
OCCUPATIONAL MEDICINE			
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: School of Public Health	Occupational Medicine 201 Introduction to Occupational Medicine	Nov. 22-Jan. 29, part time	25.00
	Occupational Medicine 202 The Occupational Diseases	Jan. 31-March 31, part time	25.00
Columbia University School of Public Health, 600 W. 168th St., New York			
At: Columbia University College of Physicians and Surgeons	Introduction to Occupational Medicine	September, 12 weeks, part time	None
University of Pittsburgh Graduate School of Public Health, Pittsburgh 13	Occupational Medicine	July 1, 3 years, full time	700.00
	Industrial Hygiene	Sept. 15, 16 weeks, part time	35.00
	Industrial Medicine	Sept. 15, 9 months, full time	700.00
	Industrial Medicine	Sept. 15, 16 weeks, part time	25.00
OPHTHALMOLOGY AND OTOLARYNGOLOGY			
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Basic Science in Otolaryngology [62]	Oct. 3-June 10, full time	800.00
Research Study Club of Los Angeles, 727 W. 7th St., Los Angeles			
At: Elk's Club	24th Annual Mid-Winter Clinical Convention	Jan. 17, 14 days, full time	100.00
University of Colorado School of Medicine, 4200 E. Ninth Ave., Denver 20 [41]	Postgraduate Seminar in Ophthalmology	July 26, 4 days, full time	40.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Clinical Course in Ophthalmology	Arranged, 2 weeks, full time	50.00
	Clinical Course in Otolaryngology	Arranged, 2 weeks, full time	50.00
Northwestern University Medical School, 303 E. Chicago Ave., Chicago	Endaural Otologic Surgery and Audiology	April, 5 weeks, full time	600.00
	Basic Science Course in Extraocular Muscles [97]	Sept. 27, 2 weeks, part time	100.00
	Basic Science Course in Extraocular Muscles [97]	Arranged, 3 days a week, 1 year, full time	150.00
University of Illinois College of Medicine, 1853 W. Polk St., Chicago 12	Basic Otolaryngology	Oct. 1, 9 months, full time	750.00
	Annual Otolaryngologic Assembly	Aug. 30, 2 weeks, full time	[98]
At: Illinois Eye and Ear Infirmary	Postgraduate Course in Ophthalmology [99]	July 1, 6 months, full time	500.00
State University of Iowa College of Medicine, Iowa City			
At: University Hospital	Seminar	School year, 1 day weekly, full time	None
	Clinical Conference	School year, 1 day each month, full time	None
	General Physiology and Pathology of the Eye	Sept. 24, 2 days, full time	50.00
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Ocular Pathology	Nov. 29, 5 days, full time	100.00
	Basic Science in Ophthalmology	July 5, 1 year, full time	500.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15			
At: Harvard Medical School and Massachusetts Eye and Ear Infirmary	Basic Sciences in Ophthalmology [100]	Sept. 27, 5 months, full time	705.00
	Basic Sciences in Otolaryngology [101]	Nov. 1, 5 months, full time	930.00
Ophthalmological Study Council, 243 Charles St., Boston 15			
At: Colby College, Waterville, Maine	Lancaster Courses in Basic Ophthalmology	June 26, 11 weeks, full time	325.00
Wayne University College of Medicine, 1401 Rivard St., Detroit			
At: Kresge Eye Institute	Basic Ophthalmology	Sept. 13, 9 months, full time	500.00
American Academy of Ophthalmology and Otolaryngolgy, 100 First Avenue Bldg., Rochester, Minn.			
At: The Waldorf-Astoria Hotel, New York	Instruction Courses [102]	Sept. 19, 1 week, part time	2.00 per hour
	Home Study Courses [103]	Sept. 1, 10 months, part time	20.00
Washington University School of Medicine, Dept. of Ophthalmology, 640 S. Kingshighway, St. Louis 10	Basic Sciences of Ophthalmology [67]	October, 8 months, full time	800.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16			
At: Jewish Sanitarium and Hospital for Chronic Diseases	Combined Course in External Eye Diseases and Ophthalmoscopy	October, 8 weeks, part time	20.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Montefiore Hospital	Ophthalmology PM 61 Perimetry	April 4-May 16, part time	30.00
	Ophthalmology PM 60 Elementary Ophthalmoscopy	Jan. 12-March 9, part time	30.00
	Ophthalmology PM 62 Glaucoma	Oct. 18-Dec. 6, part time	30.00
	Ophthalmology PM 63 Physiological and Geometrical Optics	Oct. 6-Dec. 8, part time	50.00
At: Mt. Sinai Hospital	Otorhinology PM 31 Rhinoplasty and Otoplasty	July 19-31, full time	250.00
	Otorhinology PM 30 Rhinoplasty and Otoplasty	Sept. 22-Dec. 22, part time	250.00
New York Eye and Ear Infirmary, 218 Second Ave., New York	External Diseases of the Eye	Arranged, 4 weeks, full time	75.00
	Physiological Optics in Clinical Practice	Arranged, 6 weeks, full time	100.00
	Plastic Eye Surgery	Arranged, 4 weeks, full time	150.00
	Anomalies of Extraocular Muscles	Arranged, 4 weeks, full time	75.00
	Slit Lamp Microscopy	Arranged, 4 weeks, full time	100.00
	Ophthalmoscopy	Arranged, 4 weeks, full time	75.00
	Glaucoma	Arranged, 8 weeks, full time	75.00
	Operative Eye Surgery	Arranged, 4 weeks, full time	150.00
	Refraction	Arranged, 8 weeks, full time	100.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
OPHTHALMOLOGY AND OTOLARYNGOLOGY—Continued			
New York Eye and Ear Infirmary, 218 Second Ave., New York	Perimetry	Arranged, 4 weeks, full time	$ 75.00
	Roentgenology	Arranged, 1 week, full time	50.00
	Neuro-Ophthalmology	Arranged, 4 weeks, full time	75.00
	Broncho-Esophagology and Laryngeal Surgery [42]	Arranged, 11 days, full time	250.00
	The Conservative Management of Acute Sinusitis and Chronic Rhinitis	Arranged, 4-6 sessions, part time	75.00
	Resucitation	Arranged, 8 hours, part time	50.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Otolaryngology and Ophthalmology	Oct. 1, 9 months, full time	1,000.00
	Otolaryngology and Ophthalmology, Including Cadaver and Refraction	October, 1 month, full time	600.00
	Refraction	Arranged, 4 weeks, part time	100.00
	Advanced Otology	Arranged, 2 weeks, part time	250.00
	Ophthalmology, Including Cadaver Ophthalmology and Refraction	Arranged, 3 months, part time	300.00
	Operative Ophthalmology (Dissection)	Arranged, 4 weeks, part time	100.00
	Motor Anomalies	Arranged, 4 weeks, part time	50.00
	Seminar in Ophthalmology and Otolaryngology	Arranged, 8 days, full time	50.00
	Operative Nose and Throat (Dissection)	Arranged, 6 weeks, part time	150.00
	Operative Otology (Cadaver)	Arranged, 4 weeks, part time	100.00
	Clinical Ophthalmology	Arranged, 6 weeks or 3 months, part time	75.00-125.00
	Clinical Otolaryngology	Arranged, 6 weeks or 3 months, part time	100.00-150.00
	Clinical Ophthalmology and Otolaryngology	Arranged, 6 weeks or 3 months, part time	150.00-250.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	574-A Surgery of the Eye	Oct. 25-30, full time	100.00
	575-A Differential Diagnosis with the Slit Lamp [90]	Nov. 1-5, part time	75.00
	576-A Ophthalmology	Sept. 27, 9 months, full time	700.00
	578-A Ocular Expressions of Systemic Disease	Oct. 11-15, part time	50.00
	5714-A Histopathology	Oct. 11-15, part time	100.00
	593-A Basic Sciences of Otorhinolaryngology	Sept. 27, 9 months, full time	700.00
	596-A Anatomy of the Head, Neck, and Thorax for Otolaryngologists	Sept. 27, 6 weeks, part time	125.00
	5910-A Laryngology and Surgery of the Larynx and Neck	Jan. 10, 10 days, full time	200.00
	594-A Endaural Surgery	Nov. 8, 10 days, full time	200.00
	594-A Endaural Surgery	Jan. 31, 10 days, full time	200.00
State University of New York College of Medicine, 766 Irving Ave., Syracuse 10, N. Y. At: Hotel Syracuse	Postgraduate Course in Ophthalmology	Dec. 3, 2 days, full time	25.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Ophthalmology	Sept. 27, 8 months, full time	960.00
	Otolaryngology	Sept. 27, 8 months, full time	960.00
Virginia Society of Ophthalmology and Otolaryngology, Charlottesville At: University of Virginia	Fall Clinical Session	Nov. 30, 4 days, full time	35.00
ORTHOPEDIC SURGERY			
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Diseases and Injuries of Bones and Joints	July 5-30, full time	100.00
Emory University School of Medicine, 69 Butler St. S. E., Atlanta, Ga.[12]	Orthopedic Surgery	Jan. 6, full time	5.00
Northwestern University Medical School, 303 E. Chicago Ave., Chicago	Basic Science in Orthopedics [67]	Jan. 1, 6 months, full time	600.00
State University of Iowa College of Medicine, Iowa City At: University Hospital	Trauma-Fractures Conference	Sept. 10, 2 days, full time	5.00
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Basic Science as Applied to Orthopedics [104]	Sept. 6, 5 months, full time	300.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: Children's Hospital At: Massachusetts General Hospital	Orthopedic Surgery 1	Arranged, 1-12 months, full time	805.00
	Orthopedic Surgery 2	Arranged, 3-12 months, full time	805.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Hospital for Joint Diseases	Orthopedic Surgery—Survey of the Essentials of Orthopedics	March 15-27, part time	100.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Fractures and Allied Trauma	Fall, 4 weeks, full time	200.00
	Orthopedics in General Practice	November, 1 week, full time	60.00
	Orthopedics of the Foot	Arranged, 8 weeks, part time	100.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Orthopedic Surgery for General Surgeons	Arranged, 2 months, part time	100.00
	Operative Orthopedics (Dissection)	Arranged, 5 periods, part time	100.00
	Advanced Orthopedics of the Foot	Arranged, 8 periods, part time	100.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	581-A Basic Sciences as Related to Orthopedic Surgery	Jan. 3, 6 months, full time	450.00
	583-A Anatomy for Orthopedic Surgeons	Jan. 10, 5 days, full time	90.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Orthopedics	Sept. 27, 8 months, full time	960.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25 At: M. D. Anderson Hospital and Tumor Clinic At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Fractures	July, part time	Not given
	Orthopedic Surgery	Arranged, 2 weeks, full time	25.00
PARASITOLOGY			
U. S. Public Health Service, Communicable Disease Center, Virus and Rickettsia Laboratories, Montgomery, Ala.[86]	Laboratory Diagnosis of Rabies [93a,b]	Oct. 18, 1 week, full time	None
Communicable Disease Center, U. S. Public Health Service, Chamblee, Ga.	Laboratory Diagnosis of Parasitic Diseases Part 1: Intestinal Parasites [93b]	Sept. 13, 4 weeks, full time	None
	Laboratory Diagnosis of Parasitic Diseases Part 2: Blood Parasites [93b]	Oct. 11, 3 weeks, full time	None

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Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	PATHOLOGY		
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	General and Surgical Pathology	Oct. 5-June 9, part time	$175.00
Los Angeles County Medical Association, 1925 Wilshire Blvd., Los Angeles At: St. Joseph's Hospital, Burbank, Calif.	Clinical Pathological Conferences	Arranged, 1 day, part time	None
Armed Forces Insfitute of Pathology, 7th St. and Independence Ave. S. W., Washington, D. C.	Forensic Pathology [105]	Nov. 1, 5 days, full time	None
	Pathology of Diseases of Laboratory Animals [105]	Oct. 18, 5 days, full time	None
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Clinical Course in Gross and Surgical Pathology	Arranged, 6 months, full time	500.00
University of Maryland School of Medicine, 29 S. Greene St., Baltimore 1	Neuropathology [106]	Arranged, 6 months, full time	210.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: Free Hospital for Women, Brookline, Mass.	Pathology of Obstetrics and Gynecology	Jan. 6, 19 weeks, part time	155.00
Wayne University College of Medicine, 1401 Rivard St., Detroit	Gynecologic Pathology	Dec. 6, 11 weeks, part time	50.00
	Beginning Hematology	Sept. 13, 11 weeks, part time	50.00
At: Receiving Hospital	Medical Pathologic Conference	Sept. 13, 11 weeks, part time	15.00
	Medical Pathologic Conference	Dec. 6, 11 weeks, part time	15.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Mt. Sinai Hospital	Pathology PM 30 General and Special Pathology	Oct. 9, 17 weeks, part time	60.00
At: Columbia-Presbyterian Medical Center	Pathology GM 1 Surgical Pathology	Arranged, 6 months, full time	230.00
	Pathology GM 1 Surgical Pathology	Arranged, 12 months, full time	460.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Pathology	Arranged, 16 weeks, part time	200.00
	Clinical Pathology	Arranged, 26 hours, part time	100.00
New York Polyclinic Medical School and Hospital 345 W. 50th St., New York 19	Surgical Pathology	Arranged, 3 months, part time	300.00
	Urological Pathology	Arranged, 3 months, part time	150.00
	Gynecological Pathology	Arranged, 2 weeks, part time	100.00
	Blood Transfusions	Arranged, 2 weeks, part time	100.00
	Pathology	Arranged, 3 months, part time	300.00
	Pathology	Arranged, 12 months, part time	1,000.00
	Pathology for Surgeons	Arranged, 1 month, part time	100.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	442-A Surgical Pathology [90]	Sept. 21-Jan. 6, part time	200.00
	443-A Principles of Pathology	Sept. 27-Dec. 15, part time	100.00
University of Texas Postgraduate School of Medicine, 1300 Outer Belt Dr., Houston 25 At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	444-A Special Pathology for Surgeons	Jan. 6-June 16, part time	125.00
	Surgical Pathology and Pathologic Anatomy	Arranged, 2 weeks, full time	25.00
	Clinical Pathology	Arranged	25.00
	PEDIATRICS		
Emory University School of Medicine, 69 Butler St. S. E., Atlanta 3, Ga.	Pediatrics	Oct. 7, full time	5.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Diagnosis and Treatment of Congenital and Rheumatic Heart Disease in Infants and Chiidren	Sept. 22, 12 days, part time	100.00
	Diagnosis and Treatment of Congenital and Rheumatic Heart Disease in Infants and Children	Oct. 18, 1 week, full time	100.00
	Angiocardiography and Catheterization of the Heart and Great Vessels in the Diagnosis of Congenital and Acquired Malformations in the Hearts of Infants and Children	Oct. 14, 3 days, full time	60.00
	General Pediatrics	Sept. 22, 10 days, part time	100.00
	Roentgenology and Electrocardiography in Heart Disease in Infants and Children	Oct. 11, 3 days, full time	50.00
American Academy of Pediatrics, 610 Church St., Evanston, Ill. At: Palmer House, Chicago	Annual Meeting	Oct. 2-7, 6 days, full time	[107]
State University of Iowa College of Medicine, Iowa City At: University Hospital	Pediatrics	Sept. 22, 2 days, full time	5.00
	Surgery of Infancy and Childhood	Oct. 1, 1½ days, full time	5.00
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Pediatric Therapeutics	Feb. 7, 5½ days, full time	50.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15 At: Massachusetts General Hospital	Pediatrics 1	Oct. 1, 8 months, full time	805.00
At: Children's Hospital	Pediatrics 2	Sept. 7, 4 months, full time	505.00
	Pediatrics 2	Jan. 3, 4 months, full time	505.00
University of Minnesota Center for Continuation Study, Minneapolis 14	Pediatrics for General Physicians	Jan. 8, 3 days, full time	25.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32 At: Mt. Sinai Hospital	Pediatrics PM 31 Pediatric Cardiology	Oct. 6-Dec. 22, part time	150.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Clinical Pediatrics	1 month, full time	150.00
	Clinical Pediatrics	3 months, full time	250.00
	Clinical Pediatrics	6 months, full time	450.00
	Clinical Pediatrics	9 months, full time	650.00
	Clinical Pediatrics	12 months, full time	850.00
	Pediatric Allergy Course I	October-March, once weekly, 20 weeks	300.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Pediatrics	Arranged, 4 weeks, part time	100.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	6110-A Pediatrics	Sept. 20, 9 or 12 months, full time	700.00
	611-A Clinical Pediatrics	Nov. 1, 10 weeks, part time	125.00
	614-A Review of Clinical Pediatrics	Sept. 20, 6 days, full time	50.00
	618-A Pediatric Cardiology	Dec. 6, 5 days, full time	50.00
Southern Pediatric Seminar, Saluda, N. C.	Pediatric and Internal Medicine Course	July 12, 2 weeks, full time	50.00
Frank E. Bunts Educational Institute, 2020 E. 93d St., Cleveland 6	Current Therapy in Pediatric Practice	Sept. 29, 2 days, full time	15.00
Medical Society of the State of Pennsylvania, Commission on Graduate Education, 230 State St., Harrisburg At: Erie, Allentown, Wilkes-Barre, Williamsport, Harrisburg, Johnston, and Pittsburgh	Pediatrics	Fall, 5 days, full time	35.00

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Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	PEDIATRICS—Continued		
St. Christopher's Hospital for Children, 2600 N. Lawrence St., Philadelphia 33 [43]	Practical Course in Pediatrics for General Practitioners	November, 20 weeks, part time	$ 50.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Pediatrics	Sept. 27, 8 months, full time	960.00
	Practical Pediatric Hematology	Sept. 14, 4 days, full time	80.00
University of Texas Postgraduate School of Medicine, College of Medicine, 1400 Outer Belt Dr., Houstin 25 [44]			
At: Texas Childrens Hospital	Growth and Development in Infancy and Childhood	November, 3 days, full time	Not given
At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Pediatrics	September, May, 1 month, full time	25.00
	PHARMACOLOGY		
State University of Iowa College of Medicine, Iowa City	Advanced Pharmacology	Arranged, weekly, part time	None
	PHYSICAL MEDICINE AND REHABILITATION		
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Physical Medicine	Oct. 6-Nov. 24, part time	30.00
University of Southern California School of Medicine, 2025 Zonal Ave., Los Angeles 33			
At: Los Angeles County Hospital	880 Electrodiagnosis and Electromyography	Arranged, 1 month	100.00
	879 Advanced Clinical Practice in Physical Medicine	Arranged, 1 year, full time	1,000.00
American Congress on Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2			
At: Palmer House	Instruction Seminar	Aug. 31, 5 days, part time	108
University of Buffalo School of Medicine, 3435 Main St., Buffalo 14 [45]	Physical Medicine and Rehabilitation	Sept. 23, 20 days, part time	300.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Columbia-Presbyterian Medical Center	Physical Medicine and Rehabilitation GM 1	July 1, 6 months, full time	230.00
	Physical Medicine and Rehabilitation GM 1	July 1, 12 months, full time	460.00
Institute of Physical Medicine and Rehabilitation, Bellevue Medical Center, 400 E. 34th St., New York	A Seminar on the Rehabilitation of Children	Oct. 18, 5 days, full time	40.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Physical Medicine and Rehabilitation	Arranged, 4 weeks, full time	100.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	738-A Physical Medicine and Rehabilitation	Sept. 27, 9 months, full time	700.00
	7311-A Physical Medicine and Rehabilitation	Arranged, 10 days, full time	75.00
	7312-A Seminar on the Rehabilitation of Children	Oct. 18, 5 days, full time	40.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Physical Medicine and Rehabilitation	Sept. 27, 8 months, full time	960.00
	PHYSICAL THERAPY		
University of California School of Medicine and Medical Extension, 405 Hilgard Ave., Los Angeles 24			
At: San Diego, Calif.	Office Physical Therapy [65]	July or August, 3 days, full time	17.50
	PHYSIOLOGICAL CHEMISTRY		
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Biochemical Background of Clinical Medicine	Sept. 22, 10 days, part time	100.00
Wayne University College of Medicine, 1401 Rivard St., Detroit	Physiological Chemistry Seminar	Sept. 13, 11 weeks, part time	15.00
	Physiological Chemistry Seminar	Dec. 6, 11 weeks, part time	15.00
	Special Topics	Sept. 13, 11 weeks, part time	15.00
	Intermediary Metabolism	Dec. 6, 11 weeks, part time	15.00
	Survey of Medical Chemistry	Sept. 13, 11 weeks, part time	15.00
	PHYSIOLOGY		
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Surgical Physiology	Oct. 7-June 9, part time	75.00
Mercy Hospital, Hillcrest Dr., San Diego 3, Calif.	Applied Physiology	Arranged, weekly, part time	None
San Diego County General and Mercy Hospital, San Diego, Calif.	Physiology [82]	Nov. 3-Feb. 12, part time	None
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Physiology	Sept. 22, 10 days, part time	100.00
State University of Iowa College of Medicine, Iowa City	Physiology	Arranged, once weekly, part time	Not given
	Advanced Physiology of Respiration and Circulation	Fall semester, 2 days weekly, part time	None
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Applied Physiology	Sept. 27-Jan. 24, part time	50.00
Wayne University College of Medicine, 1401 Rivard St., Detroit	Physiology and Pharmacology Seminar	Sept. 13, 11 weeks, part time	15.00
	Physiology and Pharmacology Seminar	Dec. 6, 11 weeks, part time	15.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Mt. Sinai Hospital	Physiology PM 32 Normal and Pathological Physiology	Oct. 20-April 6, part time	100.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Physiology of the Cardiovascular System and Blood	Arranged, 1 month, part time	75.00
	Physioloy and Respiration	Arranged, 1 month, part time	75.00
	Physiology of the Nervous System	Arranged, 2 weeks, part time	50.00
	Physiology of the Special Senses	Arranged, 1 month, part time	75.00
	Physiology of the Endocrine System	Arranged, 1 month, part time	75.00
	Physiology and Chemistry of the Gastrointestinal Tract; Digestion	Arranged, 1 month, part time	150.00
	Applied Physiology	Arranged, 36 hours, part time	300.00
	Histology	Arranged, 5 weeks, full time	300.00
	Newer Concepts in the Physiology of Cancer	Arranged, 6 weeks, part time	150.00
	Nutrition	Arranged, 1 month, part time	150.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	5420-A Normal and Pathological Physiology	Sept. 7-17, full time	100.00
University of Montreal Faculty of Medicine, 2900 Mount Royal Blvd., Montreal 26, Canada	Continuation Course in Physiology [109]	Fall, 15 weeks, part time	150.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	PLASTIC SURGERY		
American Academy of Plastic Surgery for Head and Neck, 307 Second Ave., New York At: Manhattan General Hospital	Otolaryngologic Plastic Surgery	Sept. 27, 3 weeks, full time	$250.00
	POLIOMYELITIS		
Orthopaedic Hospital and Rancho, Los Amigos Respiratory Center, Los Angeles [45]	Poliomyelitis	October, 5 days, full time	15.00
Georgia Warm Springs Foundation, Warm Springs, Ga.	Physical Therapy and Occupational Therapy in the Care of Poliomyelitis	January, 6 months, full time	None [110]
	Physical Therapy and Occupational Therapy in the Care of Poliomyelitis	October, 6 months, full time	None [110]
	Poliomyelitis [45]	October, 1 week, full time	Not given
Children's Medical Center, 300 Longwood Ave., Boston	Acute and Convalescent Poliomyelitis [45]	Aug. 2, 5 days, full time	50.00
	Refresher Course [45]	Aug. 2, 5 days, full time	50.00
	PROCTOLOGY		
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Lecture and Cadaver Course in Proctology	Oct. 13, 5 days, part time	100.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1] At: Jewish Hospital	Proctology	October, 12 weeks, part time	40.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Proctology, Gastroenterology, Operative Proctology (Dissection)	October, 6 weeks, part time	200.00
	Clinical and Cadaver Proctology	January, 6 months, part time	200.00
	Clinical Proctology	Arranged, 6 weeks, part time	75.00
	Clinical and Cadaver Proctology	Arranged, 6 weeks, part time	175.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25 At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Proctology	Arranged, 2 weeks, full time	25.00
	PSYCHOANALYTIC TRAINING		
American Institute for Psychoanalysis, 220 W. 98th St., New York 25	Readings in Psychoanalysis Part III	Sept. 13, 15 weeks, part time	45.00
	Fundamentals of Psychoanalytic Technique	Sept. 13, 20 weeks, part time	80.00
	Continuous Case Seminar	Sept. 14, 10 weeks, part time	40.00
	Theory of Neurosis	Sept. 16, 15 weeks, part time	45.00
	Clinical Conferences on Case Histories I	Sept. 17, 10 weeks, part time	30.00
	Clinical Conferences	Dec. 2, 10 weeks, part time	40.00
At: New School for Research	Neuroses and Psychoses	Oct. 4, 15 weeks, part time	21.00
	Workshop on Dynamics of Behavior	Oct. 5, 15 weeks, part time	35.00
At: Washington, D. C.	The Basic Concepts of Psychoanalysis [114]	September-May, part time	60.00
	Basic Literature of Psychoanalysis: A Seminar [46]	September-May, part time	60.00
	The Interpretation of Dreams: A Seminar [46]	September-May, part time	60.00
	Pathological Formations [46]	September-May, part time	60.00
	Literature of Psychoanalysis [46]	September-May, part time	60.00
	Scientific Method [46]	September, 6 hours, part time	12.00
	Theory and Technique of Dream Interpretation [46]	September-December, part time	48.00
	Introduction to Technique of Psychoanalysis [46]	September-January, part time	40.00
	The Continuous Case Seminar [46]	September-May, part time	60.00
	Clinical Conference [46]	September-May, part time	60.00
	Technique of Psychoanalysis [46]	September-May, part time	60.00
	Current Literature of Psychoanalysis [46]	September-May, part time	60.00
	Seminar on Dreams [46]	October-January, part time	60.00
	Applied Psychoanalysis [47]	October-February, part time	40.00
	Child Analysis [47]	October-January, part time	32.00
	Continuous Case Seminar in Child Analysis [47]	October-May, part time	60.00
At: New Orleans Psychoanalytic Training Center, New Orleans	Continuous Case Seminar [115]	September-May, part time	600.00
	Child Analysis [46]	September-May, part time	600.00
	Applied Psychoanalysis [46]	September-May, part time	600.00
	Seminar on Dreams [46]	September-May, part time	600.00
	Current Literature [46]	September-May, part time	600.00
	Technique of Psychoanalysis [46]	September-May, part time	600.00
	Clinical Conference [46]	September-May, part time	600.00
	Interpretation of Dreams [46]	September-May, part time	600.00
	Basic Literature of Psychoanalysis [46]	September-May, part time	600.00
	Basic Concepts of Psychoanalysis [46]	September-May, part time	600.00
At: Baltimore Psychoanalytic Institute, 11 E. Chase St., Baltimore 2	Psychoanalysis [116]	Fall, winter, and spring, 5 years part time	Varies
At: Boston Psychoanalytic Society and Institute, Inc., 15 Commonwealth Ave., Boston	Psychoanalysis [116]	5 years, part time	900.00 [117]
At: Columbia University College of Physicians and Surgeons [118]	Training in Psychoanalytic Medicine [119]	3 years, full time	825.00
At: Philadelphia [48]	Course I: Professional School Course [120]	September, 3 years, full time	400.00
	Course II: Application of Psychoanalysis to Psychiatry [121]	September, 3 years, full time	400.00
	Course III: Psychoanalysis of Children and Adolescents [122]	September, 5 years, full time	[123]
At: Institute for Psychoanalytic Medicine of Southern California, 416 N. Bedford Dr., Beverly Hills, Calif.	Psychoanalysis [117]	Fall, winter, and spring, 5 years, part time	Not given
At: Los Angeles Institute for Psychoanalysis, 344 N. Bedford Dr., Beverly Hills, Calif.	Training in Psychoanalysis [124]	3 years, part time	[112]
	Special Course for Physicians	Arranged, part time	[112]
At: New York Psychoanalytic Institute, 247 E. 82d St., New York 28	Psychoanalysis [116]	Not given	475.00
At: Philadelphia Psychoanalytic Institute, Medical Tower, Suite 2908, 255 S. 17th St., Philadelphia 3	Psychoanalysis [116]	Fall, winter, and spring, 5 years, part time	250.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
PSYCHOANALYTIC TRAINING—Continued			
At: State University Medical Center at New York City, 606 Winthrop St., Brooklyn 3	Psychoanalysis [116]	5 years, part time	Not given
At: San Francisco	Psychoanalysis [116]	Sept. 15, 5 years, part time	$150.00 per semester
At: Western New England Institute for Psychoanalysis, 340 Whitney Ave., New Haven 11	Psychoanalysis [116]	Arranged. 5 years, part time	Not given
At: The Institute for Psychoanalysis, 664 N. Michigan Ave., Chicago 11	Psychoanalysis [116]	Fall, winter, and spring, 5 years, part time	1,550.00
At: Topeka Institute for Psychoanalysis, 3617 W. Sixth Ave., Topeka, Kan.	Psychoanalysis [116]	5 years, part time	Not given
At: Seattle Psychoanalytic Training Center, 4710 University Way, Seattle 5 [49]	Psychoanalysis [116]	Fall, winter, and spring, 5 years, part time	Varies
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Readings in Psychoanalytic Literature	Fall, 15 weeks, part time	50.00
	Personality Structure and Psychoanalysis	Fall, 15 weeks, part time	50.00
	Integration of Psychoanalytic Orientations	October, 15 weeks, part time	50.00
William Alanson White Institute of Psychiatry, Psychoanalysis and Psychology, 12 E. 86th St., New York 28	Comprehensive Course in Psychoanalysis for Psychiatrists	September, 4-6 years, part time	750.00
	Basic Psychoanalytic Principles and Seminar in Basic Psychoanalytic Principles	Oct. 5, 11 weeks, part time	20.00
	Modern Conceptions of Psychoanalysis Part I	Oct. 4, 6 weeks, part time	20.00
PUBLIC HEALTH			
Johns Hopkins University School of Hygiene and Public Health, 615 N. Wolfe St., Baltimore 5	Public Health	Varies [125]	1,200.00
Harvard University School of Public Health, 55 Shattuck St., Boston 15	Public Health and Industrial Health [126]	Sept. 27, 8 months, full time	1,150.00
	Public Health and Industrial Health	Feb. 2, 8 months, full time	1,150.00
New York State Health Department, Albany 1 [50]			
At: Albany, Syracuse, Rochester, Buffalo, and Poughkeepsie	Extension Course in Public Health [127]	Arranged, 6 days, part time	25.00
Columbia University School of Public Health, 600 W. 168th St., New York 32	Master of Public Health	September, 9 months, full time	835.00
PULMONARY DISEASE			
Fitzsimmons Army Hospital, Denver 8 [51]	Seventh Annual Symposium on Pulmonary Diseases [128]	Sept. 12, 5 days, full time	None
Communicable Disease Center, U. S. Public Health Service, Chamblee, Ga.	Laboratory Methods in the Study of Pulmonary Mycoses [93b]	Nov. 29, 2 weeks, full time	None
	Laboratory Diagnosis of Tuberculosis [93b]	Nov. 15, 2 weeks, full time	None
American College of Chest Physicians, Council on Postgraduate Medical Education, 112 E. Chestnut St., Chicago			
At: Knickerbocker Hotel, Chicago	Ninth Annual Postgraduate Course in Diseases of the Chest	Oct. 18, 5 days, full time	75.00
At: Hotel New Yorker, New York	Seventh Annual Postgraduate Course in Diseases of the Chest	Nov. 8, 5 days, full time	75.00
American College of Chest Physicians, 112 E. Chestnut St., Chicago 11 [52]	Pulmonary Diseases	Oct. 20, 3 days, full time	15.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Bellevue Hospital	Medicine PM 80 Diseases of the Chest	Oct. 1-31, full time	75.00
At: Montefiore Hospital	Medicine PM 80 Diseases of the Chest	Feb. 1-28, full time	75.00
	Medicine PM 71 Diseases of the Chest	Jan. 7-May 27, part time	100.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Pulmonary Tuberculosis	Arranged, 3 weeks, full time	175.00
	Diseases of the Chest	October and November, 2 months, part time	100.00
American Trudeau Society, P. O. Box 2, Saranac Lake, N. Y. [53]	Symposium for General Practitioners on Tuberculosis and Other Chronic Pulmonary Diseases [130]	July 12, 5 days, full time	129
Trudeau-Saranac Institute, Trudeau, N. Y. [54]			
At: Saranac Lake, N. Y.	Symposium for General Practitioners on Tuberculosis and Other Chronic Pulmonary Diseases [130]	July 12, 5 days, full time	129
Ohio Trudeau Society, 1575 Neil Ave., Columbus 1, [55]			
At: Granville Inn, Granville, Ohio	Tuberculosis Therapy Conference	Oct. 29, 2 days, full time	10.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25			
At: Turner Memorial Home, El Paso	Diseases of the Chest	Sept. 19, 8 weeks, part time	25.00
At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Diseases of the Chest	Arranged, 2 weeks, full time	25.00
RADIOLOGY			
St. Joseph's Hospital, 501 S. Buena Vista, Burbank, Calif.	X-Ray Seminar	Arranged, 1 day, part time	None
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Roentgenology	Oct. 5-June 7, part time	100.00
University of California School of Medicine, Medical Extension, 405 Hilgard Ave., Los Angeles 24	Fundamental Principles of Radioactivity Including Clinical Use of Radioisotopes	Sept. 16, 40 weeks, 200 hours, part time	700.00
University of Southern California School of Medicine, 2025 Zonal Ave., Los Angeles 33			
At: Los Angeles County Hospital	858 Diagnostic and Therapeutic Radiology [131]	Arranged, 3 months, full time	250.00
	858 Diagnostic and Therapeutic Radiology [131]	Arranged, 6 months, full time	500.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	RADIOLOGY—Continued		
At: Los Angeles County Hospital	858 Diagnostic and Therapeutic Radiology [131]	Arranged, 9 months, full time	$750.00
	858 Diagnostic and Therapeutic Radiology [131]	Arranged, 12 months, full time	1,000.00
Armed Forces Special Weapons Project, Medical Branch, Washington, D. C.			
At: Reed College, Portland 2, Ore.	Radiobiology Course	Aug. 2-Jan. 21, full time	750.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Diagnostic Radiology [132]	Arranged, 12 months, full time	750.00
	Diagnostic Roentgenology	Arranged, 8 months, full time	500.00
	Routine Clinical Course in Diagnostic Roentgenology and Fluoroscopy	Arranged, 2 weeks or more, full time	70.00
	Clinical and Didactic Course in Diagnostic Roentgenology	Oct. 4, 2 weeks, full time	125.00
	Clinical Uses of Radio Isotopes	Oct. 4, 2 weeks, full time	200.00
	Intensive Review Course in Radiation Physics	Arranged, 4 days, full time	65.00
	Diagnostic Roentgenology	Sept. 22, 10 days, part time	100.00
	High and Low Voltage X-Ray Therapy	Arranged, 1 week, full time	60.00
	High and Low Voltage X-Ray Therapy	Arranged, 2 weeks, full time	110.00
	High and Low Voltage X-Ray Therapy	Arranged, 1 month, full time	200.00
Northwestern University Medical School, 303 E. Chicago Ave., Chicago 11	Radiation Physics, Radiobiology, Isotopes [133]	January-May, part time	Not given
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15			
At: Peter Bent Brigham Hospital	General Radiology 1	Arranged, 1 month, full time	155.00
At: Massachusetts General Hospital	General Radiology 2	Arranged, 1 month, full time	155.00
At: Boston City Hospital	General Radiology 3	Arranged, 1 month, full time	155.00
At: Children's Hospital	Pediatric Radiology	Arranged, 1 month, full time	155.00
Wayne University College of Medicine, 1401 Rivard St., Detroit			
At: Receiving Hospital	Medical X-Ray Conference	Sept. 13, 11 weeks, part time	15.00
	Medical X-Ray Conference	Dec. 6, 11 weeks, part time	15.00
University of Minnesota Center for Continuation Study, Minneapolis 14	Radiology for Specialists	Nov. 9, 1 week, full time	40.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1]			
At: Jewish Hospital	X-Ray Diagnosis	October, 11 weeks, part time	30.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Mt. Sinai Hospital	Radiology PM 30 Introduction to Nuclear Radiation Physics	Oct. 13-Jan. 26, part time	60.00
	Radiology PM 31 Radiology of the Chest	Oct. 18-26, part time	25.00
	Radiology PM 34 Differential Diagnosis in Radiology of the Chest	Nov. 1-Jan. 3, part time	50.00
	Radiology PM 35 Use of Radioactive Iodine	October-December, part time	250.00
	Radiology PM 35 Use of Radioactive Iodine	January-March, part time	250.00
	Radiology PM 51 Radiotherapy	Arranged, 6 months	250.00
	Radiology PM 51 Radiotherapy	Arranged, 12 months	500.00
At: Hospital for Joint Diseases	Radiology PM 80 Roentgenographic Interpretation of Diseases of Bones and Joints	Oct. 6-Dec. 22, part time	150.00
At: Columbia-Presbyterian Medical Center	Radiology PM 1 Radiological Physics and Basic Science	Jan. 11-April 15, part time	25.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Diagnostic Roentgenology	Arranged, 6 weeks, part time	150.00
	Radium and Roentgen Therapy	Arranged, 6 weeks, part time	150.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Roentgen Interpretation and Technic	October, 3 months, full time	300.00
	Roentgen Interpretation and Technic	January, 3 months, full time	300.00
	Advanced Diagnostic Roentgenology and Radiotherapy	October, 12 months, full time	300.00
	Advanced Diagnostic Roentgenology and Radiotherapy	January, 12 months, full time	300.00
	Diagnostic Roentgenology and Radiation Therapy	October, 12 months, full time	1,000.00
	Diagnostic Roentgenology and Radiation Therapy	January, 12 months, full time	1,000.00
	Practical Course in Superficial and Deep X-Ray Therapy	Arranged, 4 weeks, part time	100.00
	Advanced Course in Radiotherapy	Arranged, 4 weeks, part time	100.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	651-A Diagnostic Radiology for General Practitioners	Sept. 29, 32 weeks, part time	100.00
	653-A Radiology, Basic Sciences	Sept. 27, 9 months, full time	700.00
	655-A Radiophysics	Oct. 19-Feb. 1, part time	75.00
	656-A Isotopes and Their Medical Applications	Oct. 6, 9 months, part time	250.00
	657-A Medical Testimony in Malpractice and Negligence Cases for Practitioners of Medicine, Law, and Allied Professions	Oct. 7-March 10, part time	100.00
	5428-A Cardiac Roentgenology	Oct. 7-8, full time	30.00
	5428-A Cardiac Roentgenology	Feb. 3-4, full time	30.00
U. S. Public Health Service, Sanitary Engineering Center, 4676 Columbia Pkwy., Cincinnati 26	Occupational Radiation Protection	Jan. 23, 2 weeks, full time	None
	Basic Course in Radiological Health	Jan. 10, 2 weeks, full time	None
American College of Physicians, 4200 Pine St., Philadelphia			
At: Memorial Center for Cancer and Allied Diseases, New York	Medical Aspects of Neoplastic Diseases	Oct. 18, 5 days, full time	[75]
American Roentgen Ray Society [56]			
At: Shoreham Hotel	Instructional Courses in Radiology	Sept. 21, 4 days, full time	[134]
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Radiology	Sept. 27, 8 months, full time	900.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	RADIOLOGY—Continued		
Institute of Nuclear Studies, P. O. Box 117, Oak Ridge, Tenn.[57]	Basic Course in Techniques of Using Radioisotopes	July 12, 4 weeks, full time	$ 25.00
	Basic Course in Techniques of Using Radioisotopes	Aug. 9, 4 weeks, full time	25.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25			
At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Radiology	Arranged, 1 week, full time	25.00
At: M. D. Anderson Hospital and Tumor Institute	Radiological Physics	September, 24 weeks, part time	Not given
	Clinical Radiotherapy	Arranged, 8 weeks, part time	Not given
	SURGERY		
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33	Basic Science in Surgery and Surgical Specialties [62]	Oct. 3-June 10, full time	800.00
	Traumatic Surgery	Oct. 5-Dec. 16, part time	50.00
	Surgical Diseases of the Peripheral Vascular System	Jan. 4-Feb. 15, part time	30.00
University of California School of Medicine, Medical Extension, Medical Center, San Francisco 22			
At: University of California Hospital	Conference on General Surgery	Sept. 13, 5 days, full time	Not given
American College of Surgeons, 40 E. Erie St., Chicago 11	Cardiovascular Surgery	Nov. 15, 4 days, part time	5.00
At: Atlantic City, N. J.	Preoperative and Postoperative Care	Nov. 15, 4 days, part time	5.00
	Surgery of the Lower Esophagus, Stomach, and Duodenum	Nov. 15, 4 days, part time	5.00
	Diseases of the Liver, Biliary Tract, and Pancreas	Nov. 15, 4 days, part time	5.00
	Gynecology and Obstetrics	Nov. 15, 4 days, part time	5.00
	Lower Extremity Amputations and Prostheses	Nov. 15, 4 days, part time	5.00
	Combined Injuries to the Extremities	Nov. 15, 4 days, part time	5.00
	Surgical Aspects of Pulmonary Disease	Nov. 15, 4 days, part time	5.00
Chicago Medical Society, 86 E. Randolph St., Chicago 1			
At: Sheraton Hotel	Basic Principles and Recent Developments in General Surgery	Nov. 15, 1 week, full time	75.00
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Intensive Review Course Considering Basic Principles in General Surgery	Sept. 20, 2 weeks, full time	200.00
	Thoracic Surgery	Oct. 11, 1 week, full time	125.00
	Esophageal Surgery	Oct. 18, 1 week, full time	150.00
	General Surgery	Oct. 4, 1 week, full time	150.00
	Gallbladder Surgery	Oct. 25, 3 days, full time	100.00
	Breast and Thyroid Surgery	Oct. 25, 1 week, full time	150.00
	Surgical Technic with Practice	Sept. 22, 10 days, part time	250.00
	Surgical Diagnosis, Preoperative and Postoperative Management	Sept. 22, 10 days, part time	125.00
	Treatment of Varicose Veins	Arranged, 10 hours, every month, part time	50.00
	Surgical Anatomy on the Cadaver	Sept. 23, 10 days, part time	125.00
	Treatment of Varicose Veins	Arranged, 2 days, full time	50.00
	Panel Course in Surgery: Stomach and Esophagus	Sept. 22, 5 days, part time	125.00
	Panel Course in Surgery: Thyroid and Parathyroid	Jan. 12, 5 days, part time	125.00
	Panel Course in Surgery: Gallbladder and Liver	Oct. 27, 5 days, part time	125.00
	Panel Course in Surgery: Large Intestine	Dec. 1, 5 days, part time	125.00
	Surgical Anatomy on the Cadaver, Clinical Surgery, Preoperative and Postoperative Management	Aug. 23, 2 weeks, full time	150.00
	Surgical Anatomy on the Cadaver, Clinical Surgery, Preoperative and Postoperative Management	Oct. 25, 2 weeks, full time	150.00
	Surgical Technic, Clinical Surgery, Surgical Anatomy, Preoperative and Postoperative Management	Aug. 9, 4 weeks, full time	325.00
	Surgical Technic, Clinical Surgery, Surgical Anatomy, Preoperative and Postoperative Management	Oct. 11, 4 weeks, full time	325.00
	Surgery of Colon and Rectum	Sept. 13, 1 week, full time	125.00
	Surgery of Colon and Rectum	Oct. 25, 1 week, full time	125.00
	Surgery of Colon and Rectum	Nov. 29, 1 week, full time	125.00
	General Surgery	July 26, 2 weeks, full time	250.00
	General Surgery	Oct. 4, 2 weeks, full time	250.00
	General Surgery	Dec. 6, 2 weeks, full time	250.00
	Practical and Didactic Course in Proctoscopy and Sigmoidoscopy	Sept. 21, 3 days, part time	50.00
	Practical and Didactic Course in Proctoscopy and Sigmoidoscopy	Oct. 12, 3 days, part time	50.00
	Practical and Didactic Course in Proctoscopy and Sigmoidoscopy	Nov. 16, 3 days, part time	50.00
	Practical and Didactic Course in Proctoscopy and Sigmoidoscopy	Jan. 5, 3 days, part time	50.00
	Intensive Course in Surgical Technic	July 26, 2 weeks, full time	250.00
	Intensive Course in Surgical Technic	Aug. 9, 2 weeks, full time	250.00
	Intensive Course in Surgical Technic	Sept. 13, 2 weeks, full time	250.00
	Intensive Course in Surgical Technic	Sept. 27, 2 weeks, full time	250.00
	Intensive Course in Surgical Technic	Oct. 11, 2 weeks, full time	250.00
	Intensive Course in Surgical Technic	Nov. 8, 2 weeks, full time	250.00
	Intensive Course in Surgical Technic	Nov. 29, 2 weeks, full time	250.00
Northwestern University Medical School, 303 E. Chicago Ave., Chicago 11	Fellowship in Fenestration Surgery [135]	Arranged, 2-6 months, full time	500.00
Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12	Surgery of Trauma and Vascular Surgery	Jan. 17, 5½ days, full time	50.00
Harvard Medical School Courses for Graduates, 25 Shattuck St., Boston 15			
At: Massachusetts General Hospital	General Surgery 1	Oct. 18, 4 weeks, full time	255.00
	General Surgery 2	Arranged, 4-12 months, full time	805.00

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Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Institution	Title of Course	Schedule of Course	Registration Fee and/or Tuition
	SURGERY—Continued		
Wayne University College of Medicine, 1401 Rivard St., Detroit	Surgery Seminar	Sept. 13, 11 weeks, part time	$ 15.00
	Surgery Seminar	Dec. 6, 11 weeks, part time	15.00
Joint Committee on Post-Graduate Education, 1313 Bedford Ave., Brooklyn 16 [1]			
At: St. John's Episcopal Hospital	Office Surgery	October, 8 weeks, part time	20.00
Columbia University College of Physicians and Surgeons, 630 W. 168th St., New York 32			
At: Mt. Sinai Hospital	Surgery PM 31 Minor Surgery	Jan. 10-12, full time	50.00
At: Columbia-Presbyterian Medical Center	Surgery GM 2 Principles of Cardiovascular Surgery	Jan. 1, 6 months, full time	460.00
	Surgery GM 2A Studies in Cardiovascular Surgery	Jan. 1, 6 months, full time	460.00
New York Medical College, Flower and Fifth Ave. Hospitals, 20 E. 106th St., New York 29	Surgical Technique	Arranged, 50 hours, part time	375.00
	Thoracic Surgery	Fall, 3 weeks, part time	375.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Combined Surgical Course, Including Cadaver Surgery and Gynecology	October, 2 months, full time	350.00
	Combined Surgical Course, Including Cadaver Surgery and Gynecology	January, 2 months, full time	350.00
	Clinical Surgery	October, 4 weeks, full time	100.00
	Clinical Surgery	January, 4 weeks, full time	100.00
	Clinical and Operative (Cadaver) Surgery	October, 4 weeks, full time	200.00
	Clinical and Operative (Cadaver) Surgery	January, 4 weeks, full time	200.00
	Thoracic Surgery	Arranged	200.00
	Traumatic Surgery, Including General Surgery, Orthopedic Surgery, and Physical Medicine	Arranged, 2 months, part time	200.00
New York University Post-Graduate Medical School, 477 First Ave., New York 16	661-A Review of General Surgery [96]	Oct. 11, 4 weeks, full time	300.00
	663-A Recent Advances in Surgery	Sept. 20, 2 weeks, full time	200.00
	664-A Trauma [136]	Nov. 29, 5½ days, full time	125.00
	665-A Surgery	Sept. 27, 1 year, full time	700.00
	666-A Diagnosis and Treatment of Trauma	Dec. 6, 6 days, full time	90.00
	6612-A Cardiac Arrest and Resuscitation	Nov. 12, 1 day, full time	50.00
Frank E. Bunts Educational Institute, 2020 E. 93d St., Cleveland 6	Review Course in General Surgery	Nov. 17, 2 days, full time	15.00
Medical Advancement Trust of the Maumee Valley Hospital, 2025 Arlington Ave., Toledo, Ohio			
At: Academy of Medicine of Toledo and Lucas County, 3101 Collingwood Ave.	Surgery of the Heart and Blood Vessels	Dec. 1, 2 days, part time	None
University of Oregon Medical School, 3181 S. W. Sam Jackson Park Rd., Portland 1 [58]	General Surgery	Oct. 4, 5 days, full time	50.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	General Surgery	Sept. 27, 8 months, full time	960.00
John Gaston Hospital, 860 Madison Ave., Memphis, Tenn.	Trauma	July 28, 3 days, full time	50.00
Southwestern Medical School, 2211 Oak Lawn Ave., Dallas 19, Texas	Recent Advances in Special Surgery	Dec. 2, 3 days, full time	30.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25	Tissue Bank	Fall, part time	Not given
University of Wisconsin Medical School, 418 N. Randall Ave., Madison	Observation Course in Surgery	Arranged, 1-6 months, full time	100.00
	TROPICAL MEDICINE		
New York University Post-Graduate Medical School, 477 First Ave., New York 16	735-A Tropical Medicine	Arranged, 7 weeks, full time	300.00
	UROLOGY		
College of Medical Evangelists, 312 N. Boyle Ave., Los Angeles 33 [59]	General Urology	Jan. 5-March 9, part time	35.00
At: Ambassador Hotel Theater	Genito-Urinary Diseases	Nov. 8-12, part time	65.00
Walter Reed Army Hospital, Washington, D. C.[4]	The James C. Kimbrough Urological Seminar	Sept. 16, 3 days, full time	None
Cook County Graduate School of Medicine, 707 S. Wood St., Chicago 12	Intensive Course in Urology	Sept. 20, 2 weeks, full time	225.00
	Practical Course in Cystoscopy	July 12, 10 days, full time	150.00
	Practical Course in Cystoscopy	July 26, 10 days, full time	150.00
	Practical Course in Cystoscopy	Aug. 9, 10 days, full time	150.00
	Practical Course in Cystoscopy	Aug. 23, 10 days, full time	150.00
	Practical Course in Cystoscopy	Oct. 11, 10 days, full time	150.00
	Practical Course in Cystoscopy	Oct. 25, 10 days, full time	150.00
	Practical Course in Cystoscopy	Nov. 8, 10 days, full time	150.00
	Practical Course in Cystoscopy	Nov. 29, 10 days, full time	150.00
New York Polyclinic Medical School and Hospital, 345 W. 50th St., New York 19	Urology	Oct. 1, 8 months, full time	800.00
	Instrumental Urology	Arranged, 4 weeks, full time	100.00
	Operative Surgery	Arranged, 2 months, part time	150.00
St. Clare's Hospital, 451 E. 51st St., New York	Urology	Arranged, 1 year, full time	750.00
American Urological Association (Western Section) [60]			
At: Biltmore Hotel, Los Angeles	Urological Seminars [137]	Nov. 8, 4 days, full time	50.00
American Urological Association (Southeastern Section) [60]			
At: Louisiana State University School of Medicine, New Orleans	Urological Seminars [137]	Nov. 8, 4 days, full time	50.00
University of Oregon Medical School, 3181 S. W. Sam Jackson Park Rd., Portland 1 [58]	Urology	Oct. 25, 5 days, full time	50.00
University of Pennsylvania Graduate School of Medicine, Philadelphia 4	Urology	Sept. 27, 8 months, full time	960.00
University of Texas Postgraduate School of Medicine, 1400 Outer Belt Dr., Houston 25			
At: Scott and White Memorial Hospital; Scott, Sherwood and Brindley Foundation; University of Texas Postgraduate School of Medicine, Temple	Clinical Urology	Arranged, 2 weeks, full time	25.00
At: M. D. Anderson Hospital and Tumor Institute	Urology	Sept. 3, 14 weeks, part time	25.00

References will be found on page 693.

Postgraduate Continuation Courses for Physicians—July 1, 1954, to Jan. 15, 1955—Continued

Sponsoring and Contributing Agencies

1. Medical Society of the County of Kings and State University of New York College of Medicine.
2. University of Pittsburgh School of Medicine.
3. Colorado Heart Association and Fitzsimons Army Hospital
4. Office of the Surgeon General, Department of the Army.
5. New York State Department of Health.
6. Cleveland Area Heart Society.
7. Philadelphia General Hospital, State Department of Health.
8. Philadelphia General Hospital, Adult Heart Program, Department of Health, Commonwealth of Pennsylvania, Heart Association of Southeastern Pennsylvania.
9. Pennsylvania Department of Health, Heart Association of Southeastern Pennsylvania.
10. Fitzsimons Army Hospital.
11. Baltimore City Medical Society.
12. American Academy of General Practice and Grady Memorial Hospital.
13. Rochester Regional Hospital Council, Rochester, N. Y.
14. Postgraduate Division, Tufts College Medical School and Bingham Associates Fund.
15. United Cerebral Palsy Association.
16. Colorado Division, American Cancer Society.
17. Oregon Chapter, American Cancer Society.
18. Puerto Rico Department of Health and Puerto Rico Medical Association.
19. Tennessee Department of Health and Tennessee Division of American Cancer Society.
20. Tuskegee Institute.
21. Fount Richardson, M.D., Fayetteville, Ark.
22. San Diego County Medical Society and San Diego Chapter, American Academy of General Practice.
23. Connecticut State Medical Society.
24. Medical Association of Georgia, American Academy of General Practice, Grady Memorial Hospital.
25. Academies of General Practice of Greater Kansas City (Mo.) and Wyandotte County (Kan.).
26. Kansas Medical Society; Kansas Academy of General Practice.
27. Wyeth, Inc.
28. P. V. Siegel, M.D., Secretary, Smithton, Mo.
29. State Board of Health; State Board of Education.
30. Burke County Medical Society.
31. In conjunction with the three medical schools at Winston-Salem, Durham, and Chapel Hill.
32. Alumni Association, Jefferson Medical College, Jefferson Ex-Interns and Ex-Residents Society.
33. South Carolina Chapter of Academy of General Practice.
34. Several pharmaceutical firms.
35. Hennepin County Medical Society, Minneapolis.
36. U. S. Public Health Service, CDC.
37. State Department of Mental Health and Bureau of Mental Hygiene of the State Department of Health, Hartford, Conn.
38. Kansas Medical Society and Kansas State Board of Health.
39. Montana State Board of Health.
40. Tennessee State Medical Association: University of Tennessee Medical College, Vanderbilt University, Tennessee State Health Dept.
41. Colorado Ophthalmological Society.
42. New York University College or Medium.
43. Temple University School of Medicine.
44. Baylor University College of Medicine.
45. National Foundation for Infantile Paralysis.
46. Washington Psychoanalytic Institute.
47. Washington Psychoanalytic Institute, U. S. Public Health Service.
48. Philadelphia Association for Psychoanalysis.
49. San Francisco Psychoanalytic Institute.
50. Albany Medical College.
51. University of Colorado School of Medicine and National Tuberculosis Association.
52. Frank E. Bunts Educational Institute.
53. Adirondack Counties Chapter of the New York State Academy of General Practice and Saranac Lake Medical Society.
54. American Trudeau Society, Adirondack Counties Chapter of the New York Academy of General Practice, and Saranac Lake Medical Society.
55. Ohio Tuberculosis and Health Association.
56. B. R. Young, M.D., Germantown Hospital, Philadelphia 44.
57. U. S. Atomic Energy Commission.
58. State of Oregon, Board of Higher Education.
59. Los Angeles Urologic Research Convention.
60. Dr. Hamilton W. McKay, 1012 Kings Dr., Charlotte 7, N. C.

Footnotes

61. For members outside Medical College Center, $50.00.
62. Formal basic science course.
63. Preparation for examination of specialty board.
64. Part of 3-day symposia.
65. Part of three 1-day symposia.
66. $1.50 per hour per course attended.
67. Formal basic science course in preparation for specialty boards.
68. $250.00 each semester.
69. Leading to the degree of Master of Medical Science in surgery, medicine, obstetrics, gynecology, anesthesiology, otolaryngology, pediatrics, radiology, and urology.
70. Except for surgery, which is $910.00; the $10.00 in fee is matriculation fee.
71. Supported financially by the M & R Laboratory.
72. Designed to meet requirements of American Board of Internal Medicine.
73. $5.00 for Colorado physicians—$15.00, all others.
74. Interns and residents—no charge, M.D.'s in Cleveland area—$20.00, M.D.'s outside Cleveland area—$40.00.
75. Members, $30.00; nonmembers, $60.00.
76. Designed to meet requirements of American Board of Dermatology and Syphilology.
77. Designed for pediatricians.
78. Continuation; second year.
79. Continuation; third year.
80. Members, $40.00; nonmembers, $75.00.
81. Members, $50.00; nonmembers, $75.00.
82. Includes food and room.
83. Fellowship stipend.
84. Degree of Doctor of Industrial Medicine conferred by Graduate School of Arts and Sciences, University of Cincinnati, on successful completion of course.
85. Designed for students preparing to take the examination.
86. $125.00 per quarter; $12.00 per week for short periods.
87. First month, $150.00; second month, $75.00; third month, $50.00; 3 following months, $25.00 each.
88. $5.00, nonmembers; members free.
89. Colored television; panels and seminars.
90. Courses recognized for credit by American Academy of General Practice.
91. Members of Clinical Society, $15.00; all others, $20.00.
92. $15.00, incoming students; $25.00, alumni; $75.00, non-alumni.
93. (*a*) Arrangements should be made by contacting Laboratory Training Service. (*b*) Course designed for laboratory technical personnel, but laboratory directors and physicians may apply. (*c*) Course in practical virology designed primarily for laboratory directors, laboratorians, and epidemiologists.
94. Formal basic science course for graduate students.
95. Qualifications of individuals to attend course (Level III).
96. For specialists.
97. In preparation for specialty board certification.
98. $200.00 for both weeks; registration may be for either one ($100.00) or for both ($200.00).
99. Basic science course in preparation for residency and, ultimately, specialty board certification.
100. Consists of three separate courses; students may be admitted to any one individually.
101. Consists of four separate courses; students may be admitted to any one individually.
102. For ophthalmology, there will be a total of about 415 hours of didactic instruction, including about 120 one-hour lectures and demonstrations and 45 continuous courses (two or more hours each), with a faculty of about 200 instructors. For otolaryngology and maxillofacial surgery, there will be a total of about 295 hours of didactic instruction, including about 120 one-hour lectures and demonstrations and 30 continuous courses (two or more hours each), with a faculty of about 150 instructors.
103. Two courses, one in ophthalmology and one in otolaryngology.
104. Fully accredited by the American Board of Orthopedic Surgery.
105. Levels I and II.
106. To prepare for examination of Specialty Board in Neurological Sciences.
107. Physicians out of school five years or less, $10.00. Those out of school over five years, $50.00.
108. $2.00 per lecture; $15.00 per series of eight lectures.
109. Formal basic science course in preparation for specialty certification in anesthesiology.
110. Scholarship available through National Foundation for Infantile Paralysis.
111. Preparatory to membership in local psychoanalytic society.
112. Lecture fee $3.00 per hour; personal psychoanalysis by arrangement.
113. $2.00-$4.00 per hour.
114. Washington Psychoanalytic Institute: open only to those physicians admitted to the Washington Psychoanalytic Institute.
115. Washington Psychoanalytic Institute: open only to accepted candidates.
116. Open to accepted candidates-in-training.
117. For theoretical course.
118. U. S. Public Health Fund; individual sponsors who have donated funds from time to time.
119. This is full-time graduate residency training leading to a certificate of completion of the requirements, not less than three years after enrollment.
120. Leading to graduate certificate as practicing analyst. Fees for personal psychoanalysis and supervision of cases are arranged between the student and the analyst.
121. For psychiatrists not wishing to specialize in psychoanalysis. Fees for personal psychoanalysis are arranged between the student and the analyst.
122. Leading to graduate certificate as a practicing analyst of children.
123. $1.50 per hour for lectures and seminars.
124. Preparatory to membership in local psychoanalytic society and the American Psychoanalytic Association.
125. Master of Public Health—one year; Doctor of Public Health—two to three years; Doctor of Science—three years minimum.
126. Postgraduate courses are offered leading to the degrees of Master of Public Health, Doctor of Public Health, and Master of Industrial Health.
127. Leads to certificate of qualification as part-time local health officer (Grade II) in New York State.
128. The qualification of individuals who may attend will include levels I and II.
129. $40.00 for members of AAGP; $50.00, nonmembers.
130. Course is approved by AAGP for 26 hours of formal credit for its members.
131. Designed for limited number of qualified physicians who wish to prepare for the American Board of Radiology or for further training in radiology.
132. Postgraduate course approved for board certification.
133. Postgraduate preparation for specialty board certification. Course designed chiefly for residents in radiology, but physicians and residents in other specialties are accepted.
134. Nonmembers, except full time graduate students in radiology, pay $1.50 per course or $5.00 for four courses.
135. Fellowship in fenestration surgery is open only to specialists who have satisfactorily completed the five-week introductory course in endaural otologic surgery and audiology. Appointments as fellows are made individually on the basis of qualifications of applicants.
136. Excluding fractures; for surgeons.
137. Basic Sciences and Clinical Branches of Urology.
138. Members: A. A. G. P. and S. O. G. P., $10.00; nonmembers: $15.00; members: season, $25.00.
139. Delaware Academy of General Practice, Wilmington, Del.
140. $50.00, members; $55.00, nonmembers; $5.00, internes and residents.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Cation Exchange in the Gastrointestinal Tract. A. G. Spencer, E. J. Ross and H. G. L. Lloyd-Thomas. Brit. M. J. **1**:603-606 (March 13) 1954.

The net uptake of cations by an exchange resin was determined at different levels of the intestinal tract in man. The rates of turnover of Na^{24} and K^{42} to and from the resin were also measured in the small and large intestines of rats. A series of dynamic equilibria were established between the cations of the exchange resin and those in the intestinal fluids. These transfers were continuous throughout the intestine, but the rates of turnover and the net uptake of cations by the resin changed as it passed onward from the stomach to the rectum. Cations throughout the body continually exchanged with those of the resin by the way of the intestinal fluids. These observations were used to interpret the results obtained in patients during the treatment with cation exchange resins. Patients were maintained on a low salt diet, but were not seriously deprived of sodium. Under these conditions, exchange resin removed from the small intestine was still predominantly bound to sodium. Salt restriction did not materially alter the sodium content of the fluid in the small intestine. In the same patients, the excretion of sodium bound to resin in the stool was low. It would seem, therefore, that the effect of salt restriction was to make the colon more efficient in removing sodium from the resin. The reabsorption of sodium is a normal function of the colon, and the increased efficiency of this mechanism during salt restriction is comparable to that exhibited by the sweat glands and the kidneys. By the use of laxatives it was possible to increase the fecal excretion of sodium during the ingestion of cation exchange resins. However, a great increment in sodium excretion was obtained only when the stools were kept fluid. Vigorous treatment of this type is not recommended, as purgatives greatly augment the excretion of potassium in the stool water. During treatment with cation exchange resins, the aim should be to keep the stools loose but not actually fluid, and to supplement the dietary intake of potassium. Saline laxatives, the cations of which become bound to the resin, and liquid paraffin, which coats the resin with a water-repellent film, must be avoided.

Pyrazinamide-Isoniazid in Tuberculosis. W. McDermott, L. Ormond, C. Muschenheim and others. Am. Rev. Tuberc. **69**:319-333 (March) 1954.

A clinical investigation was made to test the effects of pyrazinamide and isoniazid administered together and followed by isoniazid given alone in 81 patients with pulmonary tuberculosis. All but nine of the patients had far advanced or moderately advanced lesions, but none of them had received any antituberculous chemotherapy during the year prior to this treatment. Both drugs were given orally in equally divided doses twice daily, pyrazinamide in a daily dose of 50 mg. per kilogram of body weight and isoniazid in a daily dose of 5 mg. per kilogram of body weight. Sixty-one patients received the drugs for at least three months after which isoniazid was given alone; roentgenograms taken during the period of combined treatment were available for 55 of them. The general improvement was marked in 20, moderate in 22, and significant in 13. There was a rapid and sustained disappearance of the tubercle bacilli from the sputum in 90% of the patients, substantial roentgenographic improvement in 75%, and cavity closure in 65% of those who had cavitary lesions. There was no roentgenographic evidence of disease progression. However, despite these good effects, the therapy produced hepatitis. Of 3 patients who were not included among the 55, 2 died of tuberculosis within the first 11 days of treatment and one died of hepatitis on the 55th day of treatment. It was proved that the hepatitis was caused by pyrazinamide. Liver impairment, which was not fatal, was produced in five other patients. The authors conclude that pyrazinamide combined with isoniazid has a marked antituberculous action in patients with tuberculosis. Its action is superior and qualitatively different from that of current antituberculous drugs used either alone or together; but the high incidence of hepatitis caused by its administration limits its use in the present dosage. Studies are needed to test whether as high a degree of antituberculous activity of pyrazinamide in the dosage used for these patients would be exerted with a lower dosage that would not be toxic to the liver.

Diethylstilbestrol in Mumps Orchitis. W. T. Hall and R. N. F. Killeen. U. S. Armed Forces M. J. **5**:332-344 (March) 1954.

Hall and Killeen feel that the status of the synthetic estrogen, diethylstilbestrol, in the prophylaxis and treatment of mumps orchitis is not clearly defined. When orchitis developed in several patients who were receiving this drug, they considered it worthless and discontinued it, but thereafter, the incidence of orchitis appeared to increase, and at one time three out of five patients with mumps had this complication. Diethylstilbestrol was reintroduced at a higher dosage (5 mg. twice a day), and there was a sharp drop in the incidence of orchitis. The charts of all patients with the unequivocal diagnosis of mumps, who were admitted between May, 1950, and June, 1953, were reviewed. Of 110 patients 17 to 47 years of age, 13 were admitted with orchitis, and these 13 were not included in the evaluation of the prophylactic value of diethylstilbestrol. There remained 97 patients who were admitted with mumps, without orchitis; of these, 63 were given diethylstilbestrol in doses varying from 0.5 to 20 mg. daily for from 2 to 15 days. Orchitis developed in 9 of these 63 who received diethylstilbestrol prophylactically and in 11 of the 34 who did not receive preventive treatment with diethylstilbestrol. While these figures suggest that diethylstilbestrol is of value as a prophylactic against mumps orchitis, a more adequately controlled study is indicated. Clinically, the orchitis that developed during diethylstilbestrol prophylaxis appeared to be a milder form. This study did not indicate that diethylstilbestrol is of therapeutic value after orchitis has developed. Serious reactions to diethylstilbestrol are rare, but in one patient hepatocellular jaundice developed.

Bone Marrow and Liver in Iron-Deficiency Anemia: Histopathologic Study of Sections with Special Reference to Stainable Iron Content. E. Beutler, W. Drennan and M. Block. J. Lab. & Clin. Med. **43**:427-439 (March) 1954.

Beutler and associates say that although iron deficiency anemia is a common disease, relatively little attention has been paid to the histopathology of the bone marrow in this disorder. In general, only smears of aspirated marrow have been described, rarely the microscopic appearance of sections of the marrow. Recently, attention has been focused on the histochemical demonstration of iron in the marrow as a diagnostic tool by Rath, Finch, and others. Beutler and associates had the opportunity to study marrow sections as well as smears from 23 patients with iron deficiency anemia, both

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before and at various stages after the initiation of iron therapy. A limited number of needle biopsies of the liver were obtained. By utilizing an iron stain they were able to observe the deposition of iron in patients receiving several forms of iron therapy. Bone marrow from 12 normal subjects served as controls. The bone marrow of patients with untreated iron deficiency anemia was, on the average, more erythroblastic and more cellular than the marrow of the normal controls, but variability in both groups was so great that the histopathology of the marrow cannot be considered diagnostic. No appreciable correlation was found between the severity of the anemia and the degree of erythroblastic hyperplasia in the marrow of untreated patients. The marrow responded to treatment by intensified hyperplasia, roughly proportional to the degree of anemia. Stainable iron appeared in the marrow of patients with iron deficiency anemia rapidly after the intravenous administration of saccharated iron oxide, but more slowly or not at all after oral administration of iron. Needle biopsies of the liver revealed no constant pathological changes. After intravenous administration of saccharated iron oxide, storage appeared to take place exclusively in the Kupffer cells. The authors emphasize the importance of continuing oral iron therapy for a long time after the peripheral blood picture has returned to normal.

Scalene Node Biopsy in Diagnosis of Diseases of Chest. C. A. Piper. Am. Pract. **5**:182-185 (March) 1954.

Piper says that the importance of the study of the nodes in the anterior scalene muscle area was reemphasized by Daniels in 1949. These lymph nodes yield an unusually high number of positive diagnoses in chest disease, probably because of the confluence of lymphatic channels at the base of the neck. A short transverse incision is made above the clavicle extending backward from the sternocleidomastoid muscle. The carotid sheath, phrenic nerve, and transverse cervical vessels are identified and retracted. The node-containing fatty tissue, anterior and medial to the caudad portion of the anterior scalene muscle, is excised, dissected from the fat, bisected, and submitted for histological study. One-half of each node is cultured for fungi and tuberculous organisms. The author obtained 52 definite diagnoses in 185 otherwise unsolved cases. The procedure was especially useful in Boeck's sarcoid (31 cases) and bronchogenic carcinoma (10 cases). This procedure is indicated in any undiagnosed intrathoracic disease.

Failure to Produce Illness in Human Volunteers Fed Bacillus Cereus and Clostridium Perfringens. G. M. Dack, H. Sugiyama, F. J. Owens and J. B. Kirsner. J. Infect. Dis. **94**:34-38 (Jan.-Feb.) 1954.

In some instances of food poisoning, the suspected food contains large numbers of micro-organisms not previously proved to cause food poisoning. The definitive test of pathogenicity of such an organism is the production of a clinical syndrome similar to that in the outbreak in a sufficient number of human beings fed pure cultures of the organism. The experiments reported are the application of this critical feeding test to Clostridium perfringens and Bacillus cereus, two micro-organisms that have been reported as causative agents of food poisoning. The volunteer subjects ranged in age from 21 to 45 years; they were physicians, nurses, students, and other hospital personnel. In so far as possible, those with previous gastrointestinal disorders were excluded. The food poisoning potentialities of four strains of Cl. perfringens and four strains of B. cereus were examined by feeding these organisms and/or their products of growth to the volunteers. Under the experimental conditions employed, these organisms seem incapable of causing the food poisoning symptoms that have been attributed to them. In view of the negative results obtained, further evidence is required to clarify the role of Cl. perfringens and B. cereus as causative agents in food poisoning outbreaks.

SURGERY

Repair of Large Herniae with Nylon Mesh. F. E. Stock. Lancet **1**:395-396 Feb. 20) 1954.

Shoes with nylon mesh uppers gave Stock the idea of using this material in the repair of hernias. The material has a zigzag weave of very fine nylon filaments, which makes it very strong and quite incapable of fraying. Like nylon filament, it can be sterilized by boiling and does not change in consistence. It can be cut to whatever shape is required at the time of operation. Like nylon filament, it produces no undesirable tissue reactions when left in the body, and it is thought that it may prove a useful and readily available substitute for tantalum mesh. Nylon mesh has so far been used on 10 patients with inguinal hernia, one with a ventral hernia, and one after excision of a large area of internal oblique and transversus abdominis muscles for a cellular fibroma (desmoid tumor). The method of use is described. In all the cases in which this mesh has been used, there has been some induration and tenderness around the wound during the first week, but there has been no instance of sepsis or delayed healing, and all the patients have left hospital on or before the 12th postoperative day. Follow-up of these patients has shown no case of delayed sepsis or recurrence of hernias, but with regard to recurrence, the observation period has been far too short.

ACTH and Cortisone in the Treatment of Keloids. F. Ronchese and A. B. Kern. New England J. Med. **250**:238-240 (Feb. 11) 1954.

Corticotropin and cortisone were used in the treatment of five female patients with keloids. Keloid formation occurred after mastoidectomy in the postauricular region, after appendectomy at the site of the incision and after removal of the left medial meniscus at the knee in one; in the sternal region secondary to the removal of acneform pustules in one; in the ear lobes at the sites of piercing in two; and after a laceration of the neck in one. The keloids were removed surgically, except for those at the site of the appendectomy incision and at the knee. Each patient applied cortisone in an ointment base during the postoperative period. Three of the patients, in addition, received corticotropin or cortisone, or both, orally or intramuscularly. There was prompt recurrence of the keloid in the two patients in whom the use of the hormones was limited to local application. The keloid recurred in the other three patients as well. However, in the patient with keloid in the retroauricular region, the recurrent keloid was so small after therapy, as compared to the original tumors, that the result must be considered excellent, and for want of any other explanation, must be attributed to the systemically administered hormones. The keloids of abdomen and knee, which were not removed surgically, showed no improvement after the hormone therapy. The authors conclude that cortisone and corticotropin administered orally or parenterally without concomitant surgery are of no value in the treatment of keloids; cortisone ointment alone or in combination with surgery also appears to be without value. Systemically administered corticotropin and cortisone when combined with surgery may be of value in some cases. The treatment of choice is still surgery combined with irradiation. Hormone therapy should not be employed except in patients who have failed to respond to surgery combined with irradiation.

Complications Following Mitral Commissurotomy with Special Reference to Auricular Fibrillation. E. G. Dimond and E. Marques dos Santos. J. Kansas M. Soc. **55**:120-123 (March) 1954.

Of 52 patients who underwent mitral commissurotomy for mitral stenosis, 28 had normal sinus rhythm before the surgical intervention. Auricular fibrillation occurred within the first week after the intervention in eight patients, six women and two men, between the ages of 27 and 53. In these patients no embolism was recognized clinically. No deaths occurred. A normal sinus rhythm was established with quinidine in three patients and with procaine amide (Pronestyl) hydrochloride in two. The total dose of quinidine required for conversion varied from 0.53 to

9.2 gm. and that of procaine amide hydrochloride from 22 to 41.75 gm. The arrhythmia converted spontaneously to a normal rhythm in one patient. In one patient, the attempt at conversion was inadequate, and in another no attempt was made during hospitalization because of a severe postoperative psychosis. The arrhythmia may be recurrent and persistent. One patient relapsed into auricular fibrillation three times, and normal sinus rhythm was established three times before the normal rhythm could be maintained. No correlation between occult rheumatic activity in the amputated auricular appendage and the occurrence of arrhythmia was noted. Local trauma resulting from the manipulation of the auricle and edema secondary to clamping, sutures, and amputation of the auricular appendage may be the cause of the arrhythmia.

A Transdiaphragmatic Incision for Exposing the Heart During Cardiac Arrest. J. W. Devine and J. W. Devine Jr. Am. J. Surg. **87:**415-420 (March) 1954.

The Devines say that a few years ago they were confronted with a cardiac arrest in the absence of personnel or equipment to take over the breathing for the patient if the chest was opened. Cardiac massage was unsuccessfully attempted through an intact diaphragm. It then occurred to the authors that the diaphragm could be opened just to the left of the esophageal hiatus and the heart exposed without disturbing either pleural space. This was done and the heart revived. Later, the authors used this approach again, and as far as they know it has also been used on two other occasions. The technique of the transdiaphragmatic incision consists of extending the abdominal incision above the xyphoid, and the left coronary ligament is cut, allowing retraction of the left lobe of the liver. The diaphragm is picked up between two clamps and incised just to the left of the esophageal hiatus. Through the opening in the diaphragm, the surgeon's right hand can perform cardiac massage, while the left hand occludes the abdominal aorta.

Value of Preoperative Heart Examination. E. Henriksen and E. Terslev. Nord. med. **51:**124-126 (Jan. 21) 1954. (In Danish.)

Preoperative heart examination was carried out by internists in 453 patients admitted in the surgical department of Roskilde District and City Hospital between 1946 and 1951, and preoperative classification was made with respect to the danger of cardiac complications. About 90% of the patients, who were mostly older or old persons of whom fully half presented signs of organic heart disease, withstood larger operative interventions without cardiac complications. Most of the 59 patients who were operated on in spite of the relative cardiac contraindication because of pressing surgical indication, one patient in spite of absolute cardiac contraindication, tolerated the operations. The complications that did occur were consistent with the preoperative grouping. Preoperative heart examination can afford the surgeon valuable information as to the patients in whom cardiac complications are especially to be feared. With present-day anesthesia and operation technique an organic heart disorder will in only slight degree increase the operative risk.

Occult Carcinoma of Major Bronchi. W. H. Wierman, J. R. McDonald and O. T. Clagett. Surgery **35:**335-345 (March) 1954.

The first case that stimulated the interest of Wierman and associates in the problem of occult carcinoma of the major bronchi was that of a man, aged 50, who three weeks previously had experienced an acute respiratory infection characterized by a productive cough and a temperature of 104 F. This had persisted for three days and had then responded to penicillin therapy. Since that time, he had complained of an aching pain in the right lower anterior part of the chest and a cough productive of small amounts of mucoid sputum. A roentgenogram of the chest three months before admission was said to have disclosed no abnormality. The chest roentgenograms taken at the clinic revealed a diffuse infiltration with linear fibrosis in the right lung base. He received penicillin, and 10 days later the pulmonary infiltration had greatly subsided. A cytological examination of sputum disclosed malignant cells. Bronchoscopy revealed no tumor, but roughening of the mucosa on the medial wall of the right bronchus intermedius. Biopsy of this area revealed a grade 3 squamous cell carcinoma in situ. A right thoracotomy was performed. The surgeon found the middle lobe and the anterior portion of the lower lobe to be quite indurated, and he performed a right pneumonectomy. The patient made an uneventful convalescence and was doing well 20 months after operation. No gross tumor could be found in the surgical specimen, except that the bronchial mucosa appeared to be peculiarly roughened. Numerous microscopic sections at various levels of the right main bronchus, bronchus intermedius, upper middle and lower lobe bronchi, and to a varying degree their secondary branches revealed a diffuse, grade 3 squamous cell carcinoma in situ. The involved epithelium was irregularly thickened. Papanicolaou and Koprowska reported a case of squamous cell bronchogenic carcinoma that initially had been diagnosed by cytological examination of the sputum. Necropsy revealed no grossly visible lung tumor, but a minute area of roughening of the bronchial mucosa that on sectioning was found to contain an epidermoid carcinoma in situ. Papanicolaou and Koprowska mentioned the confusing dilemma of being cronfronted with positive sputum findings and a normal-appearing roentgenogram of the chest, a situation Wierman and associates experienced several times. They cite four other cases in which surgical resection was performed. The lesions were not readily apparent in any of the five cases; one was in situ and four were grossly minute lesions with a rather wide area of in situ carcinoma surrounding the invasive portion. Cytological examination of the sputum disclosed malignant cells in all four cases in which this test was made. In one patient the carcinoma in situ involved most of the right bronchial tree, and multiple "skip areas" raised the possibility of carcinomatous involvement of the opposite bronchial tree. In another case, extension of the bronchogenic focus required resection of a portion of trachea. Malignant epithelium grows in a somewhat centrifugal manner. It obliterates the normal longitudinal furrows of the bronchial mucosa, imparting a granular or roughened appearance that can be detected bronchoscopically and that should be subjected to biopsy.

Major Vessel Damage in Lumbar Disc Operation. S. F. Seeley, C. W. Hughes and E. J. Jahnke Jr. Surgery **35:**421-429 (March) 1954.

Seeley and associates are aware of three unreported incidences of common iliac artery injury and one of inferior vena caval injury attending operation for herniated lumbar disk. Two such vascular complications were treated by them within the last two years and are described in this paper. In both, the common iliac artery was injured by careful neurosurgeons fully aware of the possibility of such injury. The lesions were located within 2 to 3 cm. of the aortic bifurcation and followed exploration of the fourth and fifth lumbar intervertebral space. Both patients were saved by heroic surgery, but not without partial disability; one had residuals of hepatitis following multiple blood transfusions and one had femoral nerve palsy and arterial insufficiency as a result of false aneurysmal formation and what was believed to be a breakdown in the homologous arterial graft. The anatomy of the lumbar vertebrae and contiguous major vessels is described and correlated with the potential types of vascular complications. Operation at the fourth and fifth lumbar intervertebral space and use of the pituitary rongeur are emphasized as being most commonly associated with these lesions. Immediate transabdominal exploration and arterial repair are recommended when this condition is confirmed or seriously suspected.

Paraplegia as a Complication of Sympathectomy for Hypertension. W. H. Mosberg Jr., H. C. Voris and J. Duffy. Ann. Surg. **139:**330-334 (March) 1954.

Mosberg and associates report eight cases of paraplegia occurring as a postoperative complication in patients who had undergone thoracolumbar sympathectomy for hypertension. Three cases, one in a man and two in women, are described in detail. One patient was subjected to left thoracolumbar sympathectomy

with resection as far cranially as the ninth dorsal ganglion and as far caudal as the first lumbar ganglion. Bilateral supradiaphragmatic splanchnicectomy and lower dorsal sympathetic ganglionectomy (dorsal vertebrae 8 through 12) was performed on the second and third patient. In two patients, paraplegia persisted, while one was improved rapidly and had learned to walk with the aid of a walker although there remained a generalized weakness of all muscle groups of both lower limbs. There was clinical evidence of an inflammation as the cause of the spinal symptoms in one patient, but the post mortem, which was of limited value because the spinal cord was not sectioned until six years after death, suggested a vascular lesion. In the second and third patients, thrombosis of the anterior spinal artery was considered. Such evidence as is available suggests a vascular mechanism. Among the factors that might contribute to vascular insufficiency of the spinal cord in these circumstances are hypotension (as a result of blood loss or chemically induced), arterial spasm, and vascular occlusion due to thrombosis, embolism, or ligature. Spinal anesthesia was not employed in any of the three and of two additional patients on which the authors had clinical details. Of these five patients, one received nitrous oxide, oxygen, and ether, and the other four were anesthetized with tribromoethanol (Avertin) given rectally in doses of 110 mg. per kilogram of body weight, supplemented with nitrous oxide and oxygen inhalation. Tribromoethanol may induce a pronounced fall in blood pressure in hypertensive patients. Paraplegia may follow either the Peet or Smithwick operation and may occur in young as well as in older persons. The phenomenon may be at least partially reversible or paraplegia may be permanent.

Benign Tumors of the Esophagus. D. P. Boyd and L. D. Hill III. Ann. Surg. **139**:312-324 (March) 1954.

Boyd and Hill report on 15 patients with benign tumors of the esophagus. There were 9 leiomyomas, 2 cysts, 2 fibromas, one hemangioma, and one polyp. The diagnosis was correctly determined in 11 patients. In one of the other four patients, a fibroma was confused with an intrathoracic goiter. A leiomyoma was thought preoperatively to be a pleuropericardial cyst in one patient, and in another a leiomyoma was thought to be a neurofibroma of the mediastinum. In one patient, a cyst was diagnosed as a posterior mediastinal mass. Benign esophageal tumors can be diagnosed with assurance by means of the barium swallow and fluoroscopy. Esophagoscopy, with or without biopsy, is not necessary in many cases. A biopsy, by breaking through the mucosa, may add greatly to the risk of removal of an esophageal tumor. In the authors' patients, all of the intramural tumors were removed by thoracotomy with enucleation of the tumor from the esophageal wall without incising the mucosa and thereby entering the lumen of the esophagus. This would not have been possible had the mucosa been opened by a biopsy. Esophagoscopy was performed in nine patients, and the benign nature of these tumors was recognized by direct vision, thus eliminating the need for a biopsy. Intraluminal tumors can be removed safely through the esophagoscope with the snare and coagulating current, provided the tumor is not too large or its pedicle too broad. The tumor was successfully removed surgically in 14 of the 15 patients. The patient with hemangioma involving the upper two-thirds of the esophagus was not treated surgically because of the size of the lesion; the resection would have included all of the esophagus and would have been a difficult technical procedure because of the enormously dilated vessels. There were no deaths, and follow-up revealed no recurrence of symptoms. In 51 cases of benign esophageal tumors collected from the literature, surgical removal of the tumor was carried out with 7 deaths and 44 survivals. The addition of the authors' 14 cases brings the total to 65 cases in which surgical removal was attempted, with 7 deaths and 58 survivals.

Diverticulum of the Esophagus. G. E. Lindskog and H. Stern. Yale J. Biol. & Med. **26**:285-294 (Feb.) 1954.

According to Lindskog and Stern, esophageal diverticula are classified into three groups that differ not only in anatomical location but also in pathogenesis. The first, and by far the commonest, type is the pharyngoesophageal located just above the junction of the hypopharynx and esophagus proper. The second or so-called traction type of diverticulum occurs in the middle portion of the esophagus in relation to the tracheal bifurcation. A very rare third type is seen in the distal esophagus just above the diaphragm. The authors summarize the available information on the anatomy, pathogenesis, symptoms, physical signs, and treatment of esophageal diverticula, and report observations on patients with these types of diverticula observed at their hospital between 1942 and 1953. Fifteen patients (12 men) with pharyngoesophageal diverticulum were treated surgically on the university service of the Grace-New Haven Hospital, during that period. The average duration of symptoms prior to admission for surgery was three years. Fourteen of the 15 complained of regurgitation as a primary symptom. Dysphagia was present in 12, cough in 5, and gurgling sounds during deglutition in 4. Two patients had noted excessive salivation; a like number were dyspneic. Physical findings attributable to the diverticula were noted in over half the cases. The clinical impression was confirmed by barium swallow, esophagoscopy, or both. Perforation of the sac during the esophagoscopy occurred once, but immediate primary resection of the ruptured diverticulum was successful. The surgical approach was through the left side of the neck in 12 cases. Primary excision of the sac was carried out in 13, despite the presence of a recent instrumental perforation in the one case, and a small mural abscess in another. Local wound infection occurred in two cases and was associated with stricture at the operative site in one. This patient required temporary gastrostomy and dilatations, but was asymptomatic one year after the operation. Transient recurrent nerve paralysis was observed three times with spontaneous recovery each time. There were no surgical deaths in this series. Six additional patients with a pharyngoesophageal diverticulum were observed, but not treated surgically. Three had no symptoms, and one was the victim of recurrent cerebrovascular accidents. The disposition of the other two is unknown. During the years under consideration, 21 cases of traction diverticulum were revealed by barium studies. Only 2 of the 21 patients had symptoms referable to the lesion; one of these had an associated stricture in the distal third of the esophagus. Five other patients had concomitant diverticular formations, two in the duodenum and three in the colon. In four patients epiphrenic diverticulum was diagnosed between 1942 and 1953; one case required surgery because of epigastric pain, weight loss, and dysphagia.

Closed Method of Lauge-Hansen for Treatment of Fractures of the Ankle. D. C. Ramsay. J. Oklahoma M. A. **47**:37-41 (Feb.) 1954.

Ramsay directs attention to exhaustive studies by Lauge-Hansen of Denmark on the diagnosis and treatment of ankle fractures, which were published in the *Archives of Surgery* in 1948, 1950, and 1952. Lauge-Hansen demonstrated the mechanism of production of ankle fractures in experimental and surgical investigations. The type of fracture depends on the position of the foot at the moment of injury and on the direction in which the abnormal force is applied. The amount of force is likewise of some significance. Lauge-Hansen's four basic fracture types of the ankle are (1) the supination-adduction fracture, (2) the supination-eversion fracture, (3) the pronation-abduction fracture, and (4) the pronation-eversion fracture. Lauge-Hansen's is a closed method, performed under anesthesia, but without instruments. It results in anatomic reposition that remains stable in a snug walking boot applied immediately after reduction and worn for 8 to 10 weeks. Ramsay describes the application of this method of genetic reduction to the various types of ankle fracture. Proper positioning, according to the principles of genetic reduction, results in excellent stability allowing painless, early ambulation. A preliminary study of 27 cases treated with genetic reduction revealed that 25 obtained excellent early anatomic and functional results. Failure of the method is noted immediately and open operation can then be performed. In Ramsay's experience, genetic reduction greatly decreased the indication for open reduction. He now reserves the open method for cases in which the genetic reduction fails, severely compounded fractures, and severely comminuted explosion type fractures.

NEUROLOGY & PSYCHIATRY

Observations on Organic Brain Damage and Clinical Improvement Following Protracted Insulin Coma. E. Revitch. Psychiatric Quart. **28:**72-92 (Jan.) 1954.

Revitch observed 15 patients with protracted coma. He ascribes this frequent occurrence of this otherwise rare complication to the introduction of deep coma therapy at his institution, the Veterans Administration Hospital, Lyons, N. J. The fifth stage of coma was obtained in practically all the patients, and the fourth stage was maintained for at least one to one and one-half hours, unless emergency termination was indicated. Literature reveals that many investigators had mentioned improvement and clinical evidence of organic brain changes after the termination of protracted coma. Revitch attempted to investigate more thoroughly the nature and extent of organic brain damage and the nature of improvement and to establish a possible relationship between clinical improvement and the brain damage due to protracted coma. Eight patients with chronic schizophrenia, in whom protracted coma developed during insulin shock therapy, were studied. Five of the patients showed marked improvement after protracted coma, and three remained unimproved. The improvement consisted of loss of tension and hostility. Patients became friendly, affable, relaxed, and interested in the environment. In spite of the return of delusional systems, the improved patients were able to function on a higher level than previously. In four of the five improved patients, improvement was preceded by severe organic brain deficit of varied duration. The organic deficit was demonstrated through clinical observation, a battery of psychological tests, and electroencephalograms. Improvement is attributed to the organic brain damage that results in disruption of associative pathways not unlike the disruption in lobotomy.

Treatment of Tuberculous Meningitis: Study of 46 Adult Patients. M. J. Fitzpatrik. Am. Rev. Tuberc. **69:**370-382 (March) 1954.

Forty-six adults, 17 to 65 years of age, with tuberculous meningitis were treated at Fitzsimon Army Hospital from 1948 to 1953. Ten of these patients had received streptomycin intrathecally and parenterally in other institutions; after their transfer to this hospital the medication by intrathecal route was discontinued, and oral and parenteral administration of chemotherapeutics was continued. Five of these patients died, three were discharged as recovered, and two had normal cerebrospinal fluid at the time of writing and were to be discharged shortly. The other 36 patients did not receive streptomycin intrathecally. In the earlier years of this study, therapy consisted of parenteral administration of streptomycin alone; after the introduction of *p*-aminosalicylic acid, this was given orally and streptomycin parenterally; and after viomycin became available this was given parenterally in addition to *p*-aminosalicylic acid orally and streptomycin parenterally. The standard treatment for the last year has been parenteral administration of 2 gm. daily of streptomycin in divided doses for two months, then 1 gm. daily until the cerebrospinal fluid became normal, and thereafter intermittent doses of 1 gm. every third day for at least six months; this was accompanied by concurrent oral administration of isoniazid in divided doses totaling 600 to 750 mg. daily and 12 gm. of *p*-aminosalicylic acid daily. Fourteen of the 36 patients died. Of the 22 survivors, 7 were discharged and 10 had normal cerebrospinal fluid at the time of writing and were expected to recover soon. Therapy failed in 19 of the 46 patients who were treated. The presence of a concomitant clinically recognized urogenital tuberculosis aggravated markedly the prognosis; six of eight patients with this form of extrameningeal tuberculosis were dead 12 months after the onset of meningitis. A subarachnoid block was clinically recognized in 6 of the 19 patients who died. There was no significant correlation between the route of administration or duration of streptomycin therapy and the development of the block. Survival had little, if any, relation to the concentration of streptomycin in the cerebrospinal fluid. Several patients died with concentrations consistently between 15 to 30 gamma per milliliter of cerebrospinal fluid and without clinical evidence of a subarachnoid block. There was, however, in those who survived a consistent lowering of the drug concentration to 1 to 5 gamma per milliliter with the return of the fluid to normal. The concentrations of viomycin and *p*-aminosalicylic acid paralleled closely those of streptomycin. The eighth cranial nerve was impaired in three who had not received streptomycin intrathecally. The impairment was not, however, incapacitating—two patients were gainfully employed—and it showed no tendency to either progress or diminish. In follow-up studies on 8 of 10 patients about 21 months later, there was no evidence of a relapse of the infection. This study proved that conservative therapy without intrathecal administration can save about 50% of adults with tuberculous meningitis. The results obtained to date with streptomycin given parenterally and isoniazid and *p*-aminosalicylic acid orally suggest that this regimen offers the best hope for the control of this disease.

Intraspinal Tumors (Report of 12 Cases). F. K. Bradford. Dis. Nerv. System **15:**55-59 (Feb.) 1954.

Bradford presents observations on 12 patients with tumors of the spinal cord. In the first four patients with neurofibroma, the diagnosis was complicated by severe residual paralysis following poliomyelitis. Cases 2 and 3 of the group with neurofibroma are of special interest in that intervertebral disk rupture was suspected in both. However, certain points in the clinical picture were at variance and prompted myelography, which pointed strongly to the diagnosis of tumor. The fourth case of neurofibroma was interesting because it showed that (1) iodized oil may flow freely past a sizable tumor, (2) a catheter may meet little resistance when it is passed by a spinal cord tumor of considerable size, and (3) even when allowance is made for the difference in the segmental level and the vertebral level of a tumor, exploration may be too low. Infection is still to be feared despite antibiotics, the use of some of which might add toxic factors. Reoperation probably adds to the danger of infection that proved fatal in this case. Two of the 12 spinal cord tumors were meningiomas. In one of these two tumors, a hard calcified shell was adherent to the dura mater, which is unusual in a meningioma. The fixation of the tumor was probably responsible for the absence of spontaneous pain or the production of pain by coughing or sneezing, despite its situation over the posterior roots. The tumor excision in case 6 was performed largely as a matter of principle, since a total paraplegia had been present for two years. It resulted in diminution of the flexion reflexes and great increase in comfort. In the two patients with congenital lipoma, more adequate surgery was possible in one than in the other, and improvement persisted for 11 years. One patient (case 9) with an apparently benign ependymal cyst, did not benefit from surgery and now has an unusual myelographic picture. In a patient with dermoid tumor (case 10), a favorable outcome appears likely even though complete removal was not possible. In cases 11 and 12, the patients had osteochondroma. From the surgical point of view, these anterior fixed lesions offer the same difficult problem presented by calcified midline cervical disk herniations with spinal cord compression. In the narrow thoracic spinal canal, the spinal cord becomes fixed over the anterior mass and forced directly against the laminas and ligamenta flava. In these two patients with osteochondroma, manometric block had not yet occurred and myelographic defects were only suggestive. Origin from the intervertebral disk is presumably excluded by both the anatomic position of the lesions and their microscopic characteristics. Bradford was unable to find reports of anterior spinal osteochondromas of this type in the literature, but it is possible that such lesions mimicked degenerative lesions until late in their course. Neurofibromas and meningiomas are difficult to diagnose early, since even partial manometric block may occur late and the protein content of the spinal fluid is variable. Long duration of symptoms by no means excludes a diagnosis of spinal cord tumor. Even congenital tumors may become disabling only in middle or old age.

GYNECOLOGY & OBSTETRICS

Vaginal Hemorrhage from Potassium Permanganate Burns. M. Steward Jr. and A. Webster. Obst. & Gynec. **3**:169-171 (Feb.) 1954.

Of 23 cases of potassium permanganate burns of the vagina observed at the Cook County Hospital in Chicago, 6 occurred between 1936 and 1952 and 17 occurred during the first 10 weeks of 1953. A typical example of this entity, in a 29-year-old Negro woman, is described. On admission, the patient was extremely pale, cold, and covered with beads of perspiration. Her blood pressure was 78/60 mm. Hg, pulse 104, and respirations 16. The vagina was filled with clots of blood totaling approximately 250 cc. The uterus was enlarged to the size of a six weeks' gestation, globular, and freely movable. The cervix was slightly softened, cyanotic, and closed. On introduction of a speculum, two blackened and depressed areas of eschar, 2 cm. in diameter and circular, were seen on the anterior and posterior vaginal walls. There was an arterial spurt of blood in the center of the posterior area. The patient admitted that she had inserted a grey tablet into the vagina in an attempt at self-abortion. Twelve hours later she began to bleed and was convinced that she had accomplished her purpose. A suture ligature was placed around the bleeder, the vagina was irrigated with sterile water, a gauze vaginal pack was inserted, and the patient was given 1,200 cc. of whole blood. The patient was discharged on the fourth hospital day with instructions to report to the prenatal clinic. Of 128 patients with potassium permanganate burns of the vagina (105 collected from the literature and 23 from Cook County Hospital), 105 were pregnant or amenorrheic. Only nine of these were known to have aborted. The period of amenorrhea varied from 24 hours to 7½ months. Most of the patients were in the first trimester. Self-abortion was the aim of most of these patients, but the method was ineffectual in most cases. The age of the patients varied from 16 to 38 years, and most were multiparous. In only one of the 128 patients was the diagnosis correct on admission. Twenty-two of the 23 Cook County Hospital patients were sent to the ward with the diagnosis of incomplete or threatened abortion. The patients typically and purposely gave a misleading history. The practice of attempting self-abortion with potassium permanganate tablets is extremely vicious, as well as ineffective. It is definitely increasing in the Chicago area and appears to be spreading westward. The diagnosis is frequently overlooked at first and cannot be made without visualization of the vaginal vault. The treatment is replacement of blood loss and hemostasis. The possibility of chemical burns of the vagina should be considered in all cases of bleeding in early pregnancy.

Urinary Estrogens and Related Compounds in Postmenopausal Women with Mammary Cancer: Effect of Cortisone Treatment. O. W. Smith and K. Emerson Jr. Proc. Soc. Exper. Biol. & Med. **85**:264-267 (Feb.) 1954.

Smith and Emerson investigated the urinary output of estrogens and related compounds under various conditions in 15 postmenopausal women, 7 of whom had cancer of the breast. From eight normal women, 72 to 96 hour specimens were analyzed, while only 24 to 48 hour collections were available in the cancer patients. One aliquot of each specimen was subjected to the usual hydrochloric acid hydrolysis, and a second to zinc hydrochloride hydrolysis prior to continuous benzene extraction for bioassay. Five of the seven cancer patients were found to excrete excessive amounts. When these five were not receiving cortisone, the output of estrogens excreted as such averaged nearly five times the mean normal, and that of compounds estrogenic after zinc hydrochloride hydrolysis averaged 16 times the mean normal. Cortisone therapy markedly lowered these titers and reduced them to normal levels in three of four patients so treated. Except during cortisone treatment, the titers of estrogen and related compounds rose with advancing disease. The surgical removal of irradiated ovaries lowered the titers of estrogens excreted as such but not of the unknown compounds rendered estrogenic by zinc hydrochloride treatment.

Rh Iso-Immunization; Treatment or Prevention. H. L. Gainey, K. S. Nicolay, J. E. Keeler and M. E. Doyle. Obst. & Gynec. **3**:141-149 (Feb.) 1954.

Fifty Rh-negative immunized women, 21 of whom had heterozygous husbands, were studied with respect to history and management to determine if any common factors could be found to suggest the manner in which the patient became immunized. One woman was immunized by transfusion but was never pregnant, and three were primiparas with negative histories, who delivered normal Rh-positive infants who were unaffected. Of the remaining 46 women, 27 (58.69%) had factors in their history that suggested an induced abnormal condition. Ten received incompatible blood transfusions, 3 had manual removals of the placenta, 4 cesarean sections, 3 induced labor, one a very traumatic third stage labor, 2 traumatic deliveries, 2 early spontaneous abortions with retained secundines treated by dilatation and curettage, one an induced abortion that preceded the immunization, and one electroshock therapy in the 32nd week of pregnancy. Many, if not all, of these factors could have been eliminated or materially reduced. Of the 63 viable infants born after sensitization of these patients, 17 were living and well without treatment, 17 were living and well after transfusion, and 29 were lost to follow-up. Twenty infants were stillborn, and there were 12 neonatal deaths. A selected group of 38 nonimmunized multiparous Rh-negative women with two to six pregnancies each were studied to determine whether these same factors could be found. In contrast to the group of the immunized patients, all the 38 women had homozygous husbands and consequently did not have even the 50% chance of Rh-negative offspring to decrease their exposures to sensitization. The 38 patients had a total of 105 conceptions, and there were a total of three abortions, one spontaneous and uncomplicated and two followed by dilatation and curettage. There were no incompatible transfusions, manual removals of placenta, induced labors, induced abortions, traumatic deliveries, traumatic third stages of labor, or shock therapy in pregnancy in this group. Therefore, there were actually 3 (7.8%) of the 38 patients who had factors similar to those that were incriminated in the 50 immunized women. The 38 patients had 103 viable infants. Even if all the patients in the control group were persons who produced antibodies under the most rigorous antigen stimulation, there were not the opportunities for their becoming immunized. The absence of a group of factors in the nonsensitized patients and the presence of these factors in the sensitized group strongly suggests that it is more than chance occurrence or abnormal placental physiology that accounts for a high percentage of the immunizations. A plea is made to reduce the opportunities for the Rh-negative pregnant women to become sensitized as the result of preventable abnormality giving them the utmost in nontraumatic and conservative care or to enhance the uncontrollable natural avenues of antigen stimulation. This might appreciably reduce the number of Rh tragedies in the future.

Improved Technique for Induction of Labor. H. M. Carey. J. Obst. & Gynaec. Brit. Emp. **61**:59-68 (Feb.) 1954.

Preeclampsia frequently dictates induction of labor. Carey shows that abdominal (cesarean) delivery of first babies could be greatly reduced if improved methods of inducing labor reduced the failure rate, if the dangers of infection of mothers and fetus were practically eliminated, and if rapid deterioration of "toxemic" cases could be prevented and placental efficiency maintained. The "toxemic" syndrome can be controlled by salt depletion, using an ion exchange resin to reinforce the effects of bed rest and a low salt diet on sodium metabolism, while the reduction in tissue edema produced by the ion exchange resins may improve the efficiency of the placenta and reduce the risk of intrauterine fetal death. While intermittent intramuscular injections of oxytocin (Pitocin) are occasionally successful in precipitating the onset of labor, oftener they are ineffective, and sometimes they produce fetal distress. Intravenous oxytocin drips are not without dangers. The improved technique for the induction of labor described by Carey permits the maintenance of a high antibiotic concentration in the amniotic cavity and vagina; this reduces the danger of infection of mother and fetus,

at the same time as the hydrostatic pressure in the amniotic cavity is recorded by means of a polyethylene catheter introduced through the cervix at the time the membranes are ruptured. In cases in which uterine activity shows evidence of subsiding after artificial rupture of the membranes, oxytocin is administered by continuous intravenous infusion and the optimum safe drip rate ascertained in each case by observing the record of uterine activity. Used in this way, the dangers of oxytocin can be avoided. The internal method of recording uterine activity, which is described, has the advantage of convenience to both obstetrician and patient over methods previously used. The patients tolerate the technique very well. This method of induction of labor can be used to effect a vaginal delivery even in primiparas with unripe cervices some weeks before term. This technique is applicable also to patients with toxemia that up to the 36th week has been controlled by bed rest and ion exchange resins.

PEDIATRICS

Atrial Septal Defect in Infants and Children. R. B. Disenhouse, R. C. Anderson, P. Adams and others. J. Pediat. **44:**269-289 (March) 1954.

The development of effective surgical methods of correcting atrial septal defects increases the need for accurate diagnosis of these anomalies in infants and children, because prompt intervention will undoubtedly save the lives of many who would otherwise die. The actual incidence of this cardiac malformation is unknown, but in a review of 202 autopsies on children with congenital heart disease it was found to be the sixth commonest abnormality; it appeared in 11 patients, in 6 of whom it was regarded as the primary cause of death. All six of these patients were less than 1 year old, with the age at death ranging from 59 hours to 7 months. Surgical closure of the defect was carried out successfully in 3 of a group of 21 patients in whom the diagnosis was established by cardiac catheterization. The principal symptoms shown by infants were feeding difficulties, recurrent respiratory infections, and growth retardation, while older children suffered from respiratory infections, exertional dyspnea, and decreased exercise tolerance. The presence of an atrial septal defect is rarely compatible with a full span of life; however, babies who survive the difficulty in infancy may improve and do well for several years. Children with atrial septal defects usually lead active and normal lives, but heart failure may occur at any time. Symptoms of distress not infrequently appear when school age is reached and general activity increases. Cardiac catheterization is at present the best method of substantiating the diagnosis during life. There are, however, definite limitations to its use in infants. Correlation of the physiological data with the clinical and roentgenologic findings is essential to their proper interpretation. Roentgenographic and roentgenoscopic examination of these patients showed a typical enlargement of the right atrium and the right ventricle, dilation of the pulmonary artery, and a small aortic knob. Left atrial enlargement was absent in all cases. The indications for surgical intervention, which should now be restricted to patients in whom the prognosis for the immediate future is poor, will undoubtedly be broadened as the procedure becomes better established.

Atresia of the Esophagus with Tracheoesophageal Fistula. A. C. Williams, H. A. Carithers and N. Weil. J. Florida M. A. **40:**621-628 (March) 1954.

The authors advise early diagnosis of esophageal atresia, since many infants with this anomaly can be cured by surgery. The prognosis is worsened by the baby's having been offered feedings, particularly if there is a tracheoesophageal fistula. In the four cases described by the authors, two patients survived and two died, one because of delay in diagnosis and treatment (the baby had well-developed bronchopneumonia) and the other because he was a premature baby with a poor chance for survival of surgery and because no lower segment of the esophagus could be found, thus making an anastomosis impossible. He was the only one of the four who did not have a fistula. The symptoms of this condition are excessive drooling of frothy mucus; choking, coughing, and difficult breathing; and immediate regurgitation of feedings associated with choking, coughing, and cyanosis. In diagnosis, an esophageal catheter should be passed to demonstrate obstruction, iodized oil should be injected to show atresia or fistula of the upper segment, and a roentgenogram should be made of the abdomen, air in the stomach being an indication of a tracheoesophageal fistula. Surgical management of the condition is described in detail.

Blood Sugar Levels in Babies Born of Diabetic Mothers. G. M. Komrower. Arch. Dis. Childhood. **29:**28-33 (Feb.) 1954.

Komrower estimated the blood sugar levels of 21 normal infants and of 40 infants born of diabetic mothers. The normal infants showed a wide scatter of blood sugar levels, but there was no dramatic rise or fall in the figures in any one case. The babies of diabetic mothers revealed a rapid drop in the first hours of life, with a slow rise toward the end of the first 24 hours. There were considerable variations. The oral administration of a 50% glucose solution to 25 of the 40 infants of diabetic mothers did not make any appreciable difference to the blood sugar levels obtained compared with the group of infants not given glucose. In spite of careful clinical observations, the author saw only four children in whom the symptoms suggested hypoglycemia; in these infants pallor, a sudden drop in temperature, shallow respirations, and occasional twitching were noted. The author believes that, in spite of the low blood sugar levels recorded in the first hours of life in the babies of diabetic mothers, the clinical picture of hypoglycemia is rare and that few, if any, babies born of diabetic mothers die as the result of hypoglycemia.

Treatment of Tuberculous Meningitis. W. W. Waddell Jr., A. P. Booker, W. C. Gregory and O. B. Bobbitt. A. M. A. Am. J. Dis. Child. **87:**273-286 (March) 1954.

Data are presented on the results of treatment of two series of infants and children with tuberculous meningitis. The first series of 19 patients was treated from May, 1947, to February, 1952, by the conventional schedule of streptomycin given intramuscularly and intrathecally with *p*-aminosalicylic acid orally and/or thiazolsulfone (Promizole) orally. The second series, six patients, was treated from May, 1952, with streptomycin intramuscularly and *p*-aminosalicylic acid and isoniazid orally, without streptomycin intrathecally. Of the 19 patients, 11 died and 8 survived, but of these only 4 were without mental or neurological defects. Of the four in good condition, two were treated once each for relapse. The longest survival was four and one-half years for a mentally defective patient and four years for a patient in good condition. Patients with associated miliary tuberculosis or tuberculous pneumonia did not apparently have a poorer prognosis than those without these pulmonary manifestations. Results in the second, small, series with only a short follow-up were in striking contrast to those in the first. Four patients are alive and are in remarkably good condition. One of these has completed the course of treatment, and three are still receiving treatment. There have been no relapses. The longest survival is 12½ months. Two patients died; one was in a terminal condition on admission and died after only three days of treatment; and the other had hydrocephalus with spastic paralysis and died despite adequate treatment. Detailed determination of isoniazid levels in the serum and cerebrospinal fluid in three of the six patients showed an average peak of serum levels three to four hours after the administration of the drug and an average peak of cerebrospinal fluid levels in four to six hours, with higher levels in the serum than in the cerebrospinal fluid. There was more variation in the serum than in the cerebrospinal fluid levels. Results warrant further clinical trial of the new regimen that consists of giving 40 mg. of streptomycin per kilogram of body weight intramuscularly per day, but not more than 1 gm., in one dose, daily until the clinical course and the cerebrospinal fluid are normal, and then three times weekly for a total course of at least six months; 0.2 to 0.4 gm. of *p*-aminosalicylic acid per kilogram of body weight orally per day in divided doses three times daily for at least 12 months; and 0.5 mg. of isoniazid per kilogram of body weight orally per day in divided doses every 12 hours for at least 12 months.

DERMATOLOGY

Rhus Dermatitis: Treatment with Corticotropin and Cortisone. D. L. Fuhrman. Missouri Med. **51:**113 (Feb.) 1954.

Fuhrman reviews the use of corticotropin and cortisone in the treatment of dermatitis venenata due to Rhus toxicodendron, Rhus diversiloba, and Rhus glabra. The data pertaining to 25 patients are given in a table. Nineteen patients were given an average total dose of 60 units of corticotropin-gel, and six patients received an average dose of 362 mg. of cortisone. The dosage schedule used for corticotropin-gel was 40 units as the first dose, 20 units the second dose, and 20 units the third dose. The dosage of cortisone acetate was one tablet every eight hours. In addition to the administration of one of these drugs, each patient was given a prescription for potassium permanganate wet compresses, and, if a larger area of the body was involved, baths were employed. For the eczematous areas an antipruritic lotion consisting of 0.25% camphor gum and 5% liquor carbonis detergens in a calamine zinc oxide and lime water base was prescribed. Under the influence of corticotropin or cortisone Rhus dermatitis does not immediately subside. These drugs do not abort the dermatitis. The patients secured almost complete relief through the vesicular, erythematous, edematous, and itching stage. They were able to resume nearly normal activities while they were convalescing. Patients who had had previous attacks stated that they recovered much more rapidly from this episode than from former attacks. Recovery took place within two weeks, never longer, unless the dermatitis had been aggravated by self-medication. Many of these patients had received injections of poison ivy extract during the acute attack, topical medication containing local anesthetics, and antihistamine ointment, all of which are strong sensitizers and often aggravate the dermatitis.

Intradermal Reaction to Suspension of Pathogenic Treponemas (Nichols Strain) with Formol: Its Value and Limitations in the Diagnosis of Syphilitic Infection. J. Gaté, J. Thivolet, A. Simeray and M. Rolland. Ann. méd. **54:**633-651 (No. 8) 1953. (In French.)

The authors describe their method for obtaining purified suspensions of Treponema pallidum treated with formaldehyde (Formol). The intradermal reaction is practiced in the deltoid region by injection of 2 cc. of the suspension and read at the beginning of the fourth day. The reaction has been proved microscopically to be a typical allergic one and not simply an ordinary inflammation. Since November, 1951, the authors have made 317 such tests on human beings. There were 211 patients known to have syphilis and 105 patients with other diseases or healthy. The reaction proved to be specific for syphilis. It was negative in primary syphilis and seldom positive in secondary syphilis. It was positive in all forms of tertiary syphilis and congenital syphilis, but inconstant in neural syphilis and latent serologic syphilis that had not been treated. The reaction may remain positive in persons whose disease has been successfully treated, especially if they are still serologically positive. The formaldehyde-treated Treponema suspension can be used in patients suspected of having cutaneous tertiary syphilis because of the clinical aspect of their lesions, for negative reaction excludes this form of the disease and a positive reaction confirms the suspicion provided there are no other visceral localizations of syphilis. The reaction can also be used with certainty in patients suspected of primary syphilis, since, if it is positive, it excludes a chancre in favor of the diagnosis of latent serologic syphilis with ordinary mucous lesions. Useful, but not absolute, information may be obtained from the reaction in three types of cases. 1. In a patient suspected of congenital syphilis with negative serologic reaction, a negative reaction is a big argument against this diagnosis, and a positive reaction confirms it. 2. In a patient suspected of having cardiovascular syphilis, on the basis of a positive blood serum and the appearance of clinical signs, a negative reaction is a strong argument against the syphilitic origin of the cardiovascular symptoms. 3. In a patient with neural syphilis, the reaction can be followed over a period of time to detect its eventual change from negative to positive and thus measure the efficacy of treatment. The test cannot be counted on to detect syphilis in the first place. A negative reaction does not always mean that syphilis is not present, and a positive reaction does not always correspond to an evolving case. It has not shown itself to be consistently positive in syphilis except in the tertiary and cardiovascular groups. It cannot be used as a criterion of cure.

OTOLARYNGOLOGY

Effect of Cigarette Smoking on Ventilatory Function in Patients with Bronchial Asthma and Obstructive Pulmonary Emphysema. H. A. Bickerman and A. L. Barach. J. Lab. & Clin. Med. **43:**455-462 (March) 1954.

Respiratory function tests were carried out before and after smoking of three cigarettes in a series of 91 patients with bronchial asthma and pulmonary emphysema and in 27 normal persons. In 108 of the 118 subjects tested, no evidence of increased bronchospasm or impaired ventilatory function was found, as determined by vital capacity and maximum breathing capacity. Reduction of vital capacity and maximum breathing capacity took place in 10 cases, but it was not accompanied by clinically perceptible increase in the severity of asthma. An increase of vital capacity and maximum breathing capacity after smoking occurred in nine patients in whom coughing, provoked by smoking, resulted in expectoration of mucoid or mucopurulent sputum. A similar but more marked rise in vital capacity was induced by inhalation of bronchodilator aerosols. In 27 patients measurement of residual volume before and after cigarette smoking showed variations within the range of accuracy of the method. Determination of the minute volume of ventilation, breathing air, and 100% oxygen apparently revealed no impairment of respiratory function; on the contrary, a decrease in minute volume of ventilation was observed in 12 of 35 tested patients in whom elimination of retained secretions followed the coughing induced by smoking. Since the patients and normal persons in this study were tested before and after smoking three cigarettes, the findings are relevant to the short-term, almost immediate effects of cigarette smoking only. They have no bearing on the effects of habitual smoking on respiratory function.

Histological Test of Tonsillar Activity Based on the Reticuloepithelial Interplay. G. Kelemen. A. M. A. Arch. Otolaryng. **59:**263-281 (March) 1954.

The presence and intensity of the process of transmigration of the white blood cells through the cryptal and, to a smaller extent, the free epithelial surfaces, as traced by observation of the reticular meshwork, was used to study the activity of the tonsillar tissue of a certain region. Tissue was taken from any part of Waldeyer's tonsillar ring and fixed immediately after removal in Zenker's solution or 10% solution of formaldehyde. The lymphocytes were traced with clarity by impregnating the fibers of the parenchymal reticulum from which they never dissociate, using the ammonical silver method with gold toning of Gomori. Scrutiny of the piece of tonsillar tissue was begun with low magnification under a wide-field microscope to obtain a comprehensive picture. The findings were then further substantiated in detail under higher magnifications. At the reticuloepithelial boundary, three stages of a "reticuloepithelial interplay" were revealed. They were: (1) the stage of complete inactivity, in which there is a lack of penetration of the epithelium by nonepithelial elements, (2) the intermediary stage, in which there is undulating of the terminal fiber of the reticulum, indicating incipient reticulization, or, on the contrary, arrested attempts to form penetrating projections, and (3) the stage of full activity in which true penetrating projections of the parenchymal reticulum perforate the epithelium and carry within their meshes the lymphocytes that are then poured out near or at the epithelial surface. Reticular projections are formed invariably above a secondary nodule. There is another form of transport, which could be called the explosive one. The secondary nodule breaks open the surface, and the cells mingled with fibers are disgorged *en masse* into the crypt through a wide gap in the epithelium. This much more infrequent mechanism is seen mostly outside the palatine tonsil. It appears in lateral folds or in the peritubal lymph accumulations. The two forms offer different resistances against forces coming from the depths of the parenchyma. The mechanism of the ejection shown in

the palatine tonsils is probably different in other regions of the ring of Waldeyer. By determination of the degree of reticular activity, it is possible to ascertain whether the lymphoid tissue of the region in question has a part to play in another sense than by its sheer mass.

THERAPEUTICS

Studies on Removal of Encephalitogenic Factor from Rabies Vaccine. G. A. Hottle and J. H. Peers. J. Immunol. **72:**236-242 (March) 1954.

Because rabies vaccine has been prepared from mammalian brain tissue, many of the disturbing reactions following the administration of the vaccine to man have been attributed to the brain tissue per se rather than to the virus of rabies. These reactions have appeared in a variety of forms, of which one of the most serious is the neuroparalytic accident. There have been reports that severe brain lesions, resembling those seen in persons who died as a result of neuroparalytic accident, may be seen in experimental animals after the parenteral injection of normal brain tissue. It, therefore, seemed advisable to eliminate from rabies vaccine the encephalitogenic factor present in brain tissue. In this report Hottle and Peers demonstrate that, by suspending the infected rabbit brain tissue in distilled water at 5 gm. per 100 ml. of suspension and centrifuging at a relative centrifugal force of 1,000 G for one hour, the major portion of the encephalitogenic factor is sedimented and the supernatant fluid contains the mouse protective antigen in undiminished potency.

Investigations on Effect of Vitamin K_1 and Vitamin K Derivatives (Menadione Preparations) in Dicumarol Intoxication. H. Dam, T. Geill, E. Lund and E. Søndergaard. Ugesk. læger. **116:**291-294 (Feb. 25) 1954. (In Danish.)

Preparations of the menadione group are practically valueless in bishydroxycoumarin (Dicumarol) overdosage, but vitamin K_1 causes a definite increase in prothrombin activity. On intravenous administration, the effect is seen in the course of one or two hours; on oral administration, certain effect can usually be demonstrated only in the course of six hours. A single dose of 5 to 10 mg. of vitamin K_1 intravenously can bring the prothrombin activity into the therapeutic range or higher. In general, however, 10 to 20 mg. of vitamin K_1 intravenously is recommended in bishydroxycoumarin intoxication with hemorrhagic diathesis. Larger doses are cautioned against because of the danger of thrombus formation on too marked increase of prothrombin activity.

Oxytetracycline Intramuscular in Treatment of Gonorrhea. B. Seid. Antibiotics & Chemother. **4:**330-332 (March) 1954.

The preparation used by Seid contained 100 mg. of oxytetracycline (Terramycin) powder and 100 mg. of magnesium chloride hexahydrate in 2% procaine. It was given by deep intramuscular injection as a single dose. As a basis for diagnosis and cure, cultures for the gonococcus (following prostatic massage and seminal vesical stripping) were made on Herrold's medium before and after the single injection. Herrold's medium is made with nutrient agar, bacte-agar, proteose peptone no. 3, and egg yolk. The author used oxytetracycline for intramuscular medication in 50 men with evidence of gonorrheal infection. There were 12 cases of acute, previously untreated gonorrheal urethritis, the remaining 38 consisting of "chronic" cases that had previously failed to respond to penicillin therapy. Of the 38 cases resistant to treatment, only 22 required more than one injection of 100 mg. of oxytetracycline. The 12 cases of untreated acute gonorrhea responded to only one injection. The local tolerance of the intramuscular preparation was tested in 1,150 other patients without gonorrheal infections. Provided it is given deeply in the muscle, oxytetracycline for intramuscular use is well tolerated and seldom causes significant local discomfort. When they do occur, symptoms consist of transient pain, sometimes with slight tenderness of induration lasting a few hours. Only 8% of 1,200 patients showed local reactions. The author concludes that the intramuscular preparation of oxytetracycline is effective in treating gonorrhea (including the acute, chronic, and penicillin-resistant forms).

Virulence of Chemoresistant Tubercle Bacilli; Second Report: Tubercle Bacilli That Have Become Resistant to Isoniazid in Vivo. G. Meissner. Beitr. Klin. Tuberk. **110:**538-546 (No. 6) 1954. (In German.)

Tubercle bacilli that had become resistant to isoniazid in vivo and were obtained from patients who had carried typical human sensitive strains before the treatment showed more or less distinct impairment of growth on egg medium. The colonies showed variations in their growth after the transfer of the first passage of fresh cultures to the egg medium. Some colonies were distinctly dysgonic, some were moderately dysgonic, and some were eugonic. The capability of tubercle bacilli to produce a macroscopically visible tuberculosis with cultivable strains in guinea pigs and the rapidity of their generalization in these experimental animals were used as criteria for testing the virulence of the isoniazid-resistant strains. The virulence of fresh cultures of isoniazid-resistant strains was impaired, and their growth in vitro was impaired. Their capability to produce a generalized tuberculosis in guinea pigs and their capability to produce a macroscopically visible tuberculosis in these animals was considerably reduced as compared with that of the sensitive strains. Tests on guinea pigs also were made with populations of tubercle bacilli that presented mixtures of isoniazid-resistant strains with sensitive or moderately sensitive strains. Multiplication of the sensitive strains occurred more rapidly in the guinea pigs, so that only sensitive strains could be demonstrated after several months in most of the organs of the guinea pigs. The low virulence of the isoniazid-resistant strains seems to be the cause of the satisfactory clinical condition of many patients with isoniazid-resistant strains as contrasted with the frequent lack of roentgenologic improvement in these patients. The impairment of growth of most of the freshly cultured strains can be considered as the cause of the so-called evanescent resistance. There are patients who, in the course of continued treatment with isoniazid, become negative, as shown on culture, despite the resistant strains that developed in the meantime. The rapid increase in sensitive strains as compared with the resistant strains in the same bacterial population is the cause of the frequently observed reduced resistance of strains in the sputum of patients after the termination of treatment. This may also be the cause of the instability of the isoniazid resistance of some pure cultures with repeated passage on egg mediums. The more rapid multiplication of sensitive strains and their ability for producing severer tuberculous lesions in the organism suggest that fresh bouts are caused by sensitive strains that are present in the diseased organ frequently side by side with resistant strains; this explains the good response of fresh bouts to repeated chemotherapy.

Mesantoin and Grave Bone Marrow Aplasias. C. Holten. Ugesk. læger. **116:**256-257 (Feb. 18) 1954. (In Danish.)

In the first case described, marked bone marrow injury was manifested five or six years after the start of treatment with Mesantoin (3-methyl-5,5-phenylethyl hydantoin), with pronounced granulocytopenia and thrombopenia, agranulocytosis, and hemorrhagic diathesis. Fully a year and a half after discontinuation of Mesantoin and after almost normal granulocytopoiesis for about a year a pronounced fall in granulocyte values occurred. Thrombopenia still persists more than two years after the end of treatment. Corticotropin (ACTH) treatment for two long periods was apparently of decisive importance for the relatively good result. In the second instance the bone marrow injury appeared about eight months after Mesantoin treatment was begun and rapidly led to fatal outcome. The special danger is that Mesantoin seems to be well tolerated for months, when grave disorder may set in. Serious danger can threaten long after withdrawal of the agent. The late manifestation and the tendency to recurrence after discontinuation of the treatment are unfortunate when the substance is to be given for an extended time, and they to some degree limit the value of the hematological control. Since Mesantoin is associated with grave complications the onset of which is unpredictable, it is a question whether its therapeutic effect is so favorable as to warrant its use.

PATHOLOGY

Leptospirosis in Swine Caused by Leptospira Pomona. T. Burnstein and J. A. Baker. J. Infect. Dis. **94:**53-64 (Jan.-Feb.) 1954.

Since reports from various parts of the world indicated that swine are important as hosts of Leptospira pomona, Burnstein and Baker investigated several aspects of this problem, such as the incidence of Lept. pomona in the swine population, the characteristics of experimental infections, and the possibility that infected pigs might be a reservoir of infection in cattle. They found that Lept. pomona produced infection in all of 25 pigs inoculated subcutaneously and in all of 7 pigs inoculated intranasally, but failed to infect 6 of 7 pigs when administered orally. Except for two pigs in which severe illness and jaundice developed, all infected animals appeared normal, showing only a slight elevation in temperature. After inoculation, Leptospira organisms were found in the blood only in the early stage of infection and in the urine in the later stages. Their persistence in the urine correlated with the finding of lesions in the kidneys. Infected pigs excreted numerous Leptospira organisms in their urine over long periods of time, which is in contrast to calves that shed relatively few organisms over a shorter period of time. Transmission of infection by contact exposure occurred readily from infected pigs to susceptible ones and to calves, but not from calves to pigs. Infection, therefore, should be widespread in the swine population, and 22% of 285 swine that came to market were found to have antibodies for Lept. pomona. These facts emphasize the importance of swine as reservoirs for Lept. pomona.

Leiomyosarcoma of Stomach: Clinicopathologic Study of 40 Cases. R. G. Giberson, M. B. Dockerty and H. K. Gray. Surg., Gynec. & Obst. **98:**186-196 (Feb.) 1954.

Adenocarcinoma, which accounts for 98% of the malignant growths of the stomach, has a rapid rate of growth, and the results of surgical treatment are discouraging. Gastric sarcomas, including lymphosarcomas, leiomyosarcomas, fibrosarcomas and angiosarcomas, account for only 2% of gastric tumors, but they occur in younger patients than do carcinomas, frequently produce massive hemorrhage, may present distinctive roentgenologic appearances, and finally, respond surprisingly well to surgical removal. Leiomyosarcomas make up about 25% of gastric sarcomas. The records reviewed here were taken from the files of the Mayo Clinic from the years 1907 to 1950, inclusive. All cases filed as leiomyosarcomas, gastric fibrosarcomas, angiosarcomas, and spindle cell sarcomas were reviewed. The gross specimens had been preserved in 10% solution of formaldehyde (formalin); these were available for review in addition to a large number of slides prepared at the time of the original diagnosis. The final evaluation comprised 40 cases of gastric leiomyosarcoma. The age and sex distribution in these 40 cases and in 135 cases reported in the literature show a nearly equal sex incidence and the greatest frequency between the ages of 40 and 59, inclusive. Eight of the patients, however, were less than 30 years of age. The most important symptoms were (1) abdominal distress, (2) gastrointestinal hemorrhage, and (3) the presence of an abdominal mass. The most characteristic physical finding was a palpable abdominal mass. Evidence of chronic loss of blood was noted in many patients. Roentgenologic studies indicative of a submucosal gastric tumor with ulceration of the overlying mucosa and the presence of a fistulous tract leading into the tumor are suggestive of leiomyosarcoma. These tumors are firm and rubbery unless they are degenerated; ulceration was present in 23 cases. The typical microscopic picture is that of smooth muscle, with increased cellularity, pleomorphism, and the presence of mitotic figures. Gastric leiomyosarcomas spread principally by way of the blood stream and invade primarily the liver. The only method of spread to lymph nodes in this series was by direct extension. Nineteen tumors metastasized or recurred. The treatment of choice is surgical removal of the neoplasm, even in the presence of metastasis. One patient lived 6 years despite metastasis in the liver. Roentgen therapy was not found to be beneficial. The five year survival rate among 26 patients whose follow-up studies warranted such calculation was 53.8%.

Agglutination of Bacteria (Hemophilus Pertussis and Salmonella Typhosa) in Vitro by Human Blood Lymphocytes and Cytoplasmic Extrusions of Lymphocytes. K. Takeda. J. Infect. Dis. **94:**72-77 (Jan.-Feb.) 1954.

Takeda points out that except for Hayes, Dougherty, and Gebhardt, who demonstrated the agglutination of Salmonella typhosa, Salmonella typhimurium, and Pseudomonas aeruginosa by lymphocytes in air-dried tissues that had been obtained from mice immunized by the same antigens, the morphological relationships between bacteria and lymphocytes remain obscure. Takeda describes the morphological relationships in vitro between the bacteria (Hemophilus pertussis and S. typhosa) and the blood lymphocytes of patients with whooping cough and typhoid fever, respectively, and of normal human beings. The blood of these subjects was mixed with H. pertussis and S. typhosa in vitro, incubated at 37 C (98.6 F), and the relationships between lymphocytes and bacteria were observed under the microscope at various times. The lymphocytes agglutinated H. pertussis around them. The phenomenon of agglutination was intensified in patients with whooping cough. The lymphocytes of the patients with typhoid fever agglutinated S. typhosa, but the lymphocytes of the healthy control showed scarcely any relationship to S. typhosa. The bacteria agglutinated by lymphocytes were more rapidly dissolved than those ingested by granulocytes, especially in the ill patients. The agglutinated bacteria were held to the lymphocyte by fine cytoplasmic extrusions that were peculiar to lymphocytes and that were not basophilic. Similar extrusions of lymphocytes were also observed in simple blood smears of patients and of healthy controls without the addition of bacteria. It is suggested that these extrusions may contain agglutinating and lysing factors against bacteria and that by this means lymphocytes of human beings may be able to capture and to dissolve bacteria, especially in the presence of homologous antibodies. The fact that S. typhosa often causes bacteremia, whereas H. pertussis is usually localized in the sites of infection may be related to a difference in the affinity of the respective bacteria for lymphocytes.

RADIOLOGY

Coarctation of the Aorta: Roentgenologic Aspects of 125 Surgically Confirmed Cases. R. D. Sloan and R. N. Cooley. Radiology **61:**701-721 (Nov.) 1953.

This report is based on 125 surgically confirmed coarctations of the aorta seen at the Johns Hopkins Hospital. The patients ranged in age from 10 weeks to 41 years, and there were 88 males and 37 females. Routine radiological studies were available in all 125 cases. These consisted of either standard chest films or barium-swallow studies in the posteroanterior and both oblique projections. In addition, contrast vascular studies were undertaken in 60 patients. A total of 47 angiocardiograms and 18 aortograms were obtained, five patients being subjected to both procedures. In three instances the contrast studies were done after surgical repair of the coarctation. The radiologist has the responsibility to establish the diagnosis of coarctation, provided that this has not already been done by nonradiological means. In the majority of the cases in the current series, the correct diagnosis had been made prior to the patient's arrival at the radiology department. In reviewing the histories, however, it was obvious that a sizable group had been followed by physicians for months or years before the presence of coarctation was detected, and in a considerable number of the cases it was a radiologist who first suggested the correct diagnosis. Once the diagnosis has been made, the radiologist must evaluate the radiological status of the heart and great vessels, the collateral circulation, and, if possible, the site and anatomy of the coarctation itself. The authors say that their radiological experience has been similar to that reported by other groups. Aortography usually gives more satisfactory visualization of the coarctation site than does angiocardiography, although in their experience it carries a greater risk. It has been suggested that contrast vascular techniques be employed routinely only in those instances in which there is a suspicion that the coarctation is atypical or in which routine radiological studies give no clear indication as to the site of the stenosis. From a practical therapeutic standpoint, it was found that these cases could

be divided into three groups, depending on the anatomic location and effective length of the coarctation. In the great majority of instances the anomaly was located in the distal aortic arch and it was surgically feasible to resect the stenosis and reestablish the aortic continuity by an end-to-end anastomosis.

Roentgenologic Observations in Addison's Disease: Review of 120 Cases. J. L. Jarvis, D. Jenkins, M. C. Sosman and G. W. Thorn. Radiology **62**:16-29 (Jan.) 1954.

Roentgenologic observations made in the course of 20 years in 64 female and 56 male patients between the ages of 10 and 71 years with Addison's disease are described. Satisfactory roentgenograms of the adrenal regions were obtained in 106 patients, and adrenal calcification was visualized in 24 (23%). Calcification in the suprarenal area was also visualized in four patients in whom intact adrenal cortical function was demonstrated by history, physical examination, laboratory findings, and corticotropin test. Although the presence of adrenal calcification is strong presumptive evidence for the existence of adrenal cortical insufficiency, it cannot be considered pathognomonic in view of the demonstration that suprarenal calcification may occur in patients with intact adrenal function. The size of the heart was determined by teleroentgenography in all patients. The mean minimal heart size, obtained in the untreated state, was −13.5%; the mean maximal cardiac size, reflecting the effects of replacement therapy, was +2.6%. Determination of heart size is of value both in the diagnosis of Addison's disease and in the regulation of maintenance therapy with adrenal cortical steroids. In untreated patients with Addison's disease not complicated by organic heart disease, the heart size is consistently below normal. After administration of the adrenal cortical hormones, cardiac dimensions increase and, in the presence of excessive therapy, may considerably exceed normal limits. Roentgen examination of the chest was carried out in 116 patients, 69 of whom did not present detectable evidence of pulmonary tuberculosis, while in 38 the findings were considered as consistent with inactive pulmonary tuberculosis. Active pulmonary tuberculosis was demonstrated in only nine patients. Of 12 patients who died and on whom necropsies were performed, adrenal tuberculosis was revealed in 6 and idiopathic atrophy in the other 6. Although the number of necropsies is too small to warrant generalization, the incidence of both pulmonary tuberculosis, as determined by roentgen examination, and adrenal tuberculosis, revealed by postmortem examination, is in agreement with the opinion of other workers that the relative importance of tuberculosis in the causation of adrenal cortical destruction is declining. Definite splenomegaly was evident in 10 of 106 patients in whom a suitable evaluation of the size of the spleen was afforded by roentgenologic examination of the abdomen. In none of the 10 patients was the spleen sufficiently enlarged to be palpable on physical examination. Since no significant correlation between the splenomegaly and the presence of active tuberculous disease was apparent, it is not unlikely that this splenomegaly may well reflect the generalized hyperplasia of the lymphatic system commonly seen in patients with Addison's disease. A significant reduction in the size of the kidneys was shown on roentgenograms in three male and 17 female patients. Since the female patients with Addison's disease are deprived of the primary source of androgenic hormone, the loss of the renotrophic action of this group of steroid agents might be responsible for the diminished size of the kidneys. Six patients had calcific deposits in the pinna of the ear that were easily visible on the routine lateral roentgenograms of the skull. Periodic roentgenologic study of patients with Addison's disease constitutes a useful addition to the effective diagnostic and therapeutic procedures presently available for its control.

The Roentgenogram—Its Place in Pulmonary Dust Diseases. R. T. Johnstone. Indust. Med. **23**:45-49 (Feb.) 1954.

Johnstone points out that, although roentgenograms are almost indispensable in the diagnosis of pulmonary dust disease, they should not be used as a by-pass to diagnosis. He cites the case of a workman who complained that the "dust at work" had impaired his health. He was advised, without benefit of x-ray examination, to change his job. Two months later he had a pulmonary hemorrhage caused by tuberculosis. His history would have revealed an insignificant exposure to an inert dust. An x-ray examination would have revealed the true nature of the disease and, instead of the admonition to change jobs, he would have been given proper treatment. The author discusses the interpretation of the roentgenogram and calls attention to certain details that must be understood to avoid misinterpretation. He stresses that there is no meeting of the minds throughout the world on the interpretation of the shadows as found in those persons exposed to industrial dusts. It is too often forgotten that exposure to pure silica will produce roentgen changes differing from those produced by a mixture of silica with other dusts of high atomic weight such as iron or barium. The mineralogy of the earth mined in Wales differs from that in Pennsylvania or Alabama. The erupted mountains of silica known as the Rockies differ from the earth in South Africa. We also know that the processing of certain silicates alters their chemical nature. Equally important is the fact that opinion on interpretation of roentgenograms tends to become biased when experience is limited to one type of industry. He whose experience is confined solely to miners in any given area is not apt to see the same roentgen changes as the one dealing with foundry workers. Also one who reads only the films of workers exposed to silica is less apt to appreciate the variations from the normal that occur in those workers who spend a lifetime exposed to inert dusts. Finally, roentgen interpretation of the pulmonary dust diseases is best done by a person who is able to combine clinical experience with that of studying the films.

Some Observations on Mitral Valve Disease. R. E. Steiner and J. F. Goodwin. J. Fac. Radiologists **5**:167-177 (Jan.) 1954.

In conjunction with the clinical observations in mitral stenosis, Steiner and Goodwin deal with the varying appearances of the left auricle, with the radiological diagnosis of mitral incompetence, and with the pulmonary vascular pattern in mitral valve disease. Their conclusions are based on a clinical and radiological study of 91 patients, a number of whom have been submitted to mitral valvulotomy. Special investigations in selected cases consisted of cardiac catheterization, tomography of the heart, angiocardiography, and microscopic examination of the pulmonary vessels in specimens of lung obtained at operation by lingular biopsy. Postmortem pulmonary arteriograms were performed in a small number of cases. The size of the left auricle was found to vary greatly. Massive enlargement of the left auricle was associated with a significant degree of mitral incompetence. A preoperative knowledge of the presence and extent of calcification may influence the surgeon in his approach to the valve should valvulotomy be contemplated. In one of the cases cited, the left auricular appendix was so heavily calcified that the left auricle had to be entered through its posterior wall. The incidence of valvular calcification in rheumatic heart disease is high and the degree varies from a tiny fleck in one of the valve leaflets to complete calcification of the cusps or annulus fibrosus. Of 48 patients who died from mitral valve disease, none had evidence of auricular calcification. In 25 the mitral valve and in 13 the aortic valve was calcified. Of the 91 patients investigated, 2 had demonstrable evidence of auricular calcification, 19 had mitral valve calcification, and 4 had aortic valve calcification. The difference between the incidence in the two groups can be explained by the fact that the postmortem series were cases of long-standing and advanced disease, whereas in the second group all grades of severity were included. None of the patients with heavy valvular calcification had any clinical or radiological evidence of significant mitral incompetence, nor was this found at operation or autopsy. A heavily calcified mitral valve can be troublesome at operation and can prevent an adequate split. Calcified valves, however, have been operated on successfully, and their radiological demonstration need not be a contraindication to operation. Angiocardiography revealed enlargement of the pulmonary arteries and narrowing of the peripheral branches in subjects with active pulmonary hypertension. Hemosiderosis was diagnosed in 25% of cases and was usually associated with high levels of pulmonary arterial pressure. In some patients there has been a slight diminution in the size of the main pulmonary artery, in others the left auricle appears to have decreased in size.

ANESTHESIA

Controlled Hypotension with Arfonad. C. F. Scurr and J. B. Wyman. Lancet **1**:338-340 (Feb. 13) 1954.

Scurr and Wyman say that the use of trimethaphen (Arfonad) camphorsulfonate for the production of controlled hypotension was described in a preliminary report in 1953. It appeared to have considerable advantages over the methonium compounds. This paper presents experiences with trimethaphen in an additional 250 operations. The drug influences the blood pressure profoundly, as do the methonium compounds. Increased depth of anesthesia and particularly the use of ether appear to increase the sensitivity of the anesthetized patient to trimethaphen. Vasopressors, such as epinephrine (Adrenalin), arterenol (Noradrenalin), and methamphetamine (Methedrine), rapidly abolish the hypotension caused by trimethaphen. While the effect of a vasopressor lasts, further doses of trimethaphen are ineffective. For this reason epinephrine infiltration of an incision is contraindicated when trimethaphen is used. Any form of general anesthesia appears to be suitable provided perfect oxygenation is assured. During deep anesthesia (especially when ether is used), patients are more sensitive to the hypotensive effects of trimethaphen. Relative resistance may be observed when the anesthesia is very light. The patient is placed in the posture suitable for the operation (often this implies a head-up tilt), and, when the anesthesia is settled, the administration of trimethaphen is begun by intravenous drip. The drip solution contains 1 mg. of trimethaphen per milliliter; administration is usually begun at the rate of 60 drops a minute. Frequent estimation of the arterial pressure is essential to determine the required rate of administration. A systolic pressure of 60 mm. Hg or less was attained in 209 patients. In 39 patients there appeared to be a "pressure floor" of about 60 to 80 mm. Hg systolic, and in 2 the lowest pressures attained were between 80 and 100 mm. Hg systolic. Increasing the dosage in these patients did not lead to further fall, but occasionally led to cumulation, indicated by a rather slow recovery of pressure when the drug was discontinued. Individual dosage requirements varied greatly. A total dose of 50 mg. of trimethaphen camphorsulfonate often sufficed to maintain the hypotensive state for an operation lasting up to two hours; but one patient was given 1,200 mg. in one and a half hours, and yet there was prompt recovery toward normal levels at the end of the operation. The authors gained the impression that trimethophen is preferable to methonium compounds for inducing hypotension for surgical purposes. Its effects are readily controlled by discontinuing its administration. This leads to much greater flexibility and increases the safety of the technique. The use of trimethaphen does not, however, remove the inherent dangers of severe arterial hypotension.

PHYSIOLOGY

Some Physiological Aspects of Adaptation to Heat. N. B. Strydom. South African M. J. **28**:112-113 (Feb. 6) 1954.

Most of the mines on the Witwatersrand in South Africa are confronted with high rock temperatures, which may reach 120 F. Because of dripping water and water sprayed to allay dust, the mine air is also humid. Mine laborers must be acclimatized to hot, humid conditions. The changes involved in this acclimatization are mainly circulatory. 1. There is an increased peripheral blood flow. Capillaries open, more arteriovenous anastamoses develop, and a general dilatation takes place. 2. There is an adjustment of blood pressure. 3. The most important factor is an increase in blood volume. A diminished venous return and a faster-beating heart are inevitable during the first day or two because of the vasodilation. After two or three days, however, the deficit between demand and supply is compensated by an increased volume of blood. Increases of up to 30% have been recorded. 4. This increase in blood volume contributes to the progressive slowing of the pulse rate. 5. The metabolic rate is decreased; this is reflected in the gradual lowering of body temperature. 6. The water and mineral exchanges become adjusted. The amount of sweat given off is increased, and there are indications that salt secretion is diminished. As the result of experimentation on the physiological effects of heat stress on mine laborers, a new method of acclimatization has been worked out. Recruits are questioned as to their state of health and so forth and then sent to work in a "cool" stope where the saturated air temperature is not more than 87 F. During the six days spent in this stope they are toughened, trained to their tasks, and partially acclimatized. This period is followed by six days of hard work in a "hot" stope with temperature of 91 to 92 F wet bulb and a good wind velocity. This method has reduced the period of acclimatization, increased production, and weeded out sick men, and the acclimatization is probably more complete than with previous methods. In heat stroke the temperature increases, and at about 107 F the heat-regulating system breaks down, with acute mental excitement, delirium, convulsions, muscular twitchings, and tremors. If the heat stroke is not fatal, it may result in permanent disability. A well-acclimatized person should not contract heat stroke, but the following factors may eliminate the acclimatization effect: (1) ill health, such as influenza, malaria and skin disorders; (2) the consumption of large amounts of liquor; (3) excessive work rates and abnormally severe environmental conditions that will predispose to heat stroke.

Importance of Autonomic Nervous System During Transfusion of Blood into Carotid Artery in Cranial Direction: I. Experiments with Anatomic Interruption of Vagal and Sympathetic Pathways of Conduction. G. Dei Poli, L. Caldarola, L. Pironti and C. Bessé. Minerva chir. **8**:881-884 (Dec. 15) 1953. (In Italian.)

Experiments were carried out to test the hypothesis that the action of blood administered through the carotid artery in the cranial direction takes place through a stimulation of the centers of the autonomic nervous system. The authors had previously observed that the arterial pressure was improved almost immediately after such transfusions even before the blood reached the heart. The experiments were made on dogs; the vagus nerve was cut in the neck in one group of dogs, and the spinal cord was sectioned in the cervical portion in another group. Blood was then withdrawn from the femoral artery of all the animals in a quantity equal to 5% of their body weight; at this point there was almost no arterial pressure and the animals were apparently dead. Blood in an amount equal to one-tenth of that withdrawn was injected into the carotid artery in the cranial direction. During the transfusion, the arterial pressure in the femoral artery and the respiratory movements were registered by the kymograph. The results indicated that the good effects obtained with this method of blood transfusion are due to a stimulation of the nervous centers. The transfusion had no effect in the dogs with sectioned spinal cords, and there were only slight modifications in the irregular respiratory movements in those with a cut vagus nerve. They attribute the good results obtained with their method of blood transfusion to a stimulation of the centers of the sympathetic nervous system. The action of the vasomotor center has probably the greatest effect on the arterial pressure, and this in turn affects the heart action. The vagus nerve may have an indirect action by influencing the respiratory center.

Id.: II. Experiments with Chemical Interruption of Vagal and Sympathetic Pathways of Conduction. G. Dei Poli, L. Caldarola, L. Pironti and C. Bessé. Minerva chir. **8**:884-885 (Dec. 15) 1953. (In Italian.)

To test the validity of the results of the experiments reported in the previous paper, the authors performed another series of experiments. They blocked the vagus nerve with intravenous injections of atropine sulfate in a group of dogs and inhibited the activity of the sympathetic nervous system with intravenous injections of ergotamine tartrate in another group of dogs. Withdrawal of blood from the femoral artery and injection of it into the carotid artery were carried out as in the previous experiments. The results were in complete agreement with those obtained after anatomic interruption of the vagal and sympathetic pathways of conduction. The authors assert that the good effects of blood transfusion into the carotid artery in the cranial direction are the result of a stimulation of the centers of the sympathetic nervous system.

BOOK REVIEWS

Current Therapy, 1954: Latest Approved Methods of Treatment for the Practicing Physician. Edited by Howard F. Conn, M.D. Consulting editors: M. Edward Davis, and others. Cloth. $11. Pp. 898. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; W. B. Saunders Company, Ltd., 7 Grape St., Shaftesbury Ave., London, W.C.2, 1954.

The sixth annual issue of this publication continues to fulfill its purpose of providing currently recognized methods of medical and surgical treatment for the practicing physician. Therapeutics is presented in detail; surgical treatment is outlined in terms of indications rather than techniques. The methods of 377 contributors appear in the present volume, in accordance with their specialized knowledge of the therapy of certain diseases. In some instances, the methods of more than one authority are given to present different concepts of the same disease. The contents are divided into sections comprising infectious, respiratory, cardiovascular, hematological, splenic, digestive, metabolic, nutritional, endocrine, urogenital, venereal, allergic, cutaneous, nervous, locomotor, obstetric, and gynecologic diseases and those due to physical and chemical agents; this section includes thermal injuries and poisonings, with a list of the chief toxic constituents of various commercial products, including both drugs and common household articles. A final section includes a roster of drugs, tables of metric and apothecaries' weights and the preparation of percentage solutions, and an index of authors and subjects. There is some lack of uniformity in the use of trade versus nonproprietary names for drugs, and preference is given to the former in some instances in which recognized generic terminology would suffice. This can be excused in the case of those drugs whose generic names are unduly long or for which generic names either have not been adopted or were not available at the time of publication. The information is properly restricted to treatment exclusive of diagnosis, and most of it is soundly conservative and expressive of current trends. It will be difficult to find a book that can match its usefulness as a concise and complete compendium of modern therapy for the clinician. The binding and printing are of high quality, and the double column format lends itself to quick reference by busy physicians.

Guide to the Classification and Identification of the Actinomycetes and Their Antibiotics. By Selman A. Waksman, Professor of Microbiology, Rutgers University, New Brunswick, N. J., and Hubert A. Lechevalier, Assistant Professor of Microbiology, Rutgers University. Cloth. $5. Pp. 246. Williams & Wilkins Company, Mount Royal & Guilford Aves., Baltimore 2, 1953.

In the course of screening actinomycetes for their ability to produce antibiotics, investigators have isolated numerous cultures of these organisms that could not be identified with those described in "Bergey's Manual of Determinative Bacteriology," sixth edition. As a result, new names for these cultures have appeared in the literature, often without regard to the established types. To make this information available to workers in the field the authors have prepared a guide for the identification of those actinomycetes that produce antibiotics, as well as of the antibiotics themselves. The first portion of the book is devoted to a classification and description of Streptomyces, Nocardia, Micromonospora, Thermoactinomyces, and Actinomyces. The authors emphasize the necessity for using well-defined media and standard conditions of cultivation when attempting to identify an organism. The concluding portion of the book contains a description and key to the identification of antibiotics produced by actinomycetes; these antibiotics are classified on the basis of their antibiotic spectrum, supplemented by their physical and chemical characteristics. Although this book is intended primarily for workers in the field of antibiotics, it should provide excellent reference material for those interested in the taxonomy of the fungi.

These book reviews have been prepared by competent authorities but do not represent the opinions of any official bodies unless specifically so stated.

Disputed Paternity Proceedings. By Sidney B. Schatkin, Assistant Corporation Counsel of City of New York. Third edition. Cloth. Pp. 823. Banks & Co., 911 Broadway, Albany, N. Y.; Matthew Bender & Co., Inc., 443 Fourth Ave., New York, 1953.

Although this unusual book discusses in the main, and chiefly for the legal profession, the laws and procedures of New York in disputed paternity proceedings, its appeal and value are confined neither to New Yorkers nor to lawyers alone. With voluminous case histories it graphically portrays the contribution of medicine to the administration of justice. It is noted in the preface to this new edition that for four centuries men have been adjudged fathers on the most meager evidence. Today, because of the reliability of blood tests, this practice of relying on unsubstantial evidence is undergoing change and the courts are demanding scientific proof. The book includes definitions of terms, descriptions of affiliation proceedings, and discussions of the scientific aspects of blood tests, in addition to material relating to law and practice in New York. It recounts actual experiences in disputed paternity cases since the availability of scientific tests, and, although the results achieved in New York are not binding elsewhere, they constitute precedent, which is persuasive. In its entirety, as it develops this precedent, this book is instructive to the physician who has an interest in forensic medicine.

Textbook of Physiology and Biochemistry. By George H. Bell, B.Sc., M.D., F.R.F.P.S.G., Professor of Physiology in University of St. Andrews at University College, Dundee, Scotland, J. Norman Davidson, M.D., D.Sc., F.R.F.P.S.G., Gardiner Professor of Physiological Chemistry in University of Glasgow, Glasgow, Scotland, and Harold Scarborough, M.B., Ph.D., F.R.C.P.E., Professor of Medicine in Welsh National School of Medicine of University of Wales, Cardiff. With foreword by Robert C. Garry, M.B., D.Sc., F.R.F.P.S.G., Regius Professor of Physiology in University of Glasgow. Second edition. Cloth. $10. Pp. 1002, with illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; E. & S. Livingstone, Ltd., 16 and 17 Teviot Pl., Edinburgh 1, 1953.

This excellent book deals with both the chemical and the physical aspects of physiology clearly and interestingly. An outstanding feature is the wealth of carefully drawn diagrams and well-reproduced photographs, especially some remarkable electron micrographs. Some aspects of physiological optics are omitted (for instance, the helpful concept of the reduced or schematic eye), as are some important aspects of growth, reproduction, and aging. There are also signs of the present tendency to leave concepts poorly defined, as in the case of the idea of a carbohydrate, and to discuss the probable explanations of a phenomenon without giving a complete description of the phenomenon itself, as in the case of puberty. Nevertheless, this book can be recommended to medical students as being probably one of the two or three best textbooks of physiology in English available today.

An Introduction to Pathology and Bacteriology for Medical Students in the Tropics. By the late E. C. Smith, B.A., M.D., D.P.H. Revised by R. Kirk, O.B.E., B.Sc., M.D., Professor of Pathology in Kitchener School of Medicine, University College of Khartoum. Second edition. Cloth. $9. Pp. 390, with 78 illustrations. Staples Press, Inc., 70 East 45th St., New York 17; Staples Press, Ltd., 83-91 Great Titchfield St., London, W.1, 1953.

The second edition of this book appears 14 years after the first publication. The text is not a complete treatise but rather an introduction to pathology, bacteriology, and parasitology for medical students in the tropics. An introductory chapter is followed by 20 others on several topics in general pathology, tumors, bacteriology, parasitic diseases commonly found in the tropics, diseases of the blood and blood-forming organs, endocrine disorders, and diseases of the liver and other abdominal organs. The final chapter has four sections: (1) types of lymphadenopathy, (2) postmortem technique, (3) stains and culture mediums, and (4) books suggested for further reference. The text is not suitable for students in the United States.

QUERIES AND MINOR NOTES

CHLORAMPHENICOL IN TYPHOID

TO THE EDITOR:—*What has been the experience in the United States regarding the intravenous administration of the wide-range antibiotics, particularly chloramphenicol (Chloromycetin), in the advanced stages of typhoid? What are adequate and maximum doses, vehicle of volume, velocity and frequency of administration, and side-effects?* *M.D., Brazil.*

ANSWER.—Experience in the treatment of the late stages of typhoid with chloramphenicol given intravenously has been very limited, indeed, in the United States as judged by the almost complete absence of reports on this subject. However, this consultant has treated typhoid late in the second week of the disease with a chloramphenicol preparation for intramuscular administration with satisfactory results. Intravenous therapy of typhoid with chloramphenicol should be expected to give equally good results. The preparation currently available for intravenous use is a solution of 500 mg. of chloramphenicol in 2 ml. of aqueous *N,N*-dimethylacetamide, available on direct order from the manufacturer. It may be used undiluted for intramuscular injection. Special handling is required for intravenous administration because of the limited solubility of the drug in physiological solutions. By using a dry syringe, 500 mg. of concentrate is added to 100 to 250 ml. of isotonic sodium chloride or dextrose solution, taking care that the needle is under the surface of the solution while the concentrate is being added. The diluted material is administered intravenously at the rate of 2 to 5 ml. per minute, never exceeding a rate of 20 ml. per minute. A dose of 500 mg. every 6 hours or 1 gm. every 12 hours will attain satisfactory blood levels in the average adult, while up to 15 to 20 mg. per kilogram of body weight every 6 hours is required for children. A new preparation for intravenous use will soon be available for general distribution, but the principles of administration will undergo no change because of this. Use of the intravenous route of administering chloramphenicol in other infections has not been attended by any increase in the side-effects of the drug. Intravenous therapy should be reserved for patients who for one reason or another are unable to take the drug by mouth. Since, late in the disease, patients in this category are likely to be suffering from severe toxemia, it would be highly desirable that serious consideration be given to controlling the toxic state as well, for example, by the careful administration of cortisone (*J. Clin. Invest.* **33**:264, 1954).

WHY WOMEN OUTLIVE MEN

TO THE EDITOR:—*Why do women live longer than men, especially those married?*

J. M. Covington Sr., M.D., Wadesboro, N. C.

ANSWER.—Males are less resistant to disease than females and this is true from birth onward. Likewise, the death rate is higher for males than females under adverse conditions. More males are born dead than females, and this is also true among some animals, including cattle, pigs, and rats. The death rate is higher among males not only at birth and during the first day of life, but also in practically each year and by about the same percentage. Nearly all diseases and defects cause more deaths among males than females. Exceptions are cancer, diabetes, exophthalmic goiter, and gallstones. Many men die from causes that affect women much less often, such as murder, industrial accidents, alcoholism, and suicides. Men are exposed to many more hazards due to their work, and these include accidents, violence, and infections. The death rate among women from childbirth has been reduced drastically in the last 15 years. Lung cancer has increased far more among men than among women. Heart disease takes a much greater toll among men than women. Improvements in home equipment and safety devices and better and quicker medical and surgical treatment have markedly cut down serious accidents to women in the home. An excellent book on this subject is "Women and Men" by Scheinfeld (New York, Harcourt, Brace and Company, 1943).

JAUNDICE AND ITCHING

TO THE EDITOR:—*A patient has chronic obstructive jaundice due to inoperable carcinoma of the common duct. Itching has become intolerable. Are there any drugs that would alleviate the itching?* *G. K. Massengill, M.D., Baltimore.*

This inquiry was referred to two consultants, whose respective replies follow.—ED.

ANSWER.—Good results have been reported from treatment with procaine amide (Pronestyl) hydrochloride, ergotaminè, and androgenic substances given to the point of physiological reactions. Too often, however, the results are found wanting.

ANSWER.—There is no known specific therapeutic agent that will relieve the pruritus in every patient who has pruritus associated with liver disease. Skin lotions of various types have been tried without effect. Some have reported temporary relief with small doses of calomel. Lundy in "Clinical Anesthesia" (Philadelphia, W. B. Saunders Company, 1942, p. 391) has reported temporary relief by giving small amounts of procaine intravenously. Recently an encouraging report was made by Lloyd-Thomas and Sherlock (*Brit. M. J.* **2**:1289-1291 [Dec. 13] 1952). They have used methyltestosterone linguets in doses of 25 mg. daily with very encouraging results.

DISINFECTION OF SWIMMING POOL

TO THE EDITOR:—*1. What will make it possible to detect urine from a swimmer in a swimming pool containing 500 cu. m. of seawater? 2. What is the best product used for disinfection of a swimming pool containing 500 cu. m. of seawater?*

Y. Piette, M.D., Ostend, Belgium.

ANSWER.—It is not practical to attempt to detect urine in a swimming pool containing 500 cu. m. of seawater. Assuming a daily secretion of 30 gm. of solids, this quantity would produce a dilution of 0.001 part per billion, so that even elimination by a large number of persons would have limited effects on the chemical composition of the water. Attempts at this detection would be made by treating the urea with urease to form ammonia, which by colorimetric techniques might be detected with a photoelectric photometer. This, however, would give a positive reaction to the urea found in perspiration, which would be in a swimming pool whether or not urine was also there.

The product most commonly used for the disinfection of seawater swimming pools is liquid chlorine in such quantity as to leave a residual of 0.2 part per million of chlorine. The chlorine demand of seawater is about the same as that of fresh water, and, to determine the quantity needed, tests would have to be made of each type of water for its chlorine demand in order to arrive at a satisfactory residual. The quantity of chlorine used would vary with whether the swimming pool is a fill-and-draw type or a flow-through type. Also the quantity of dirt and organic material would vary the demand, and a filter that removes organic material would require the use of less chlorine in the filtered water.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

AFTERIMAGES IN COLOR BLIND PERSONS

TO THE EDITOR:—*What is the succession of colors that appear in the afterimage of various color blind persons? Is there general agreement among experts on the cause of afterimages? Have any experiments been done with persons with war wounds and other injuries that show definitely the localization in the eye or brain of the afterimage? If only theories exist, which theories are most widely accepted and what are the objections to the theoretical conclusions? Can you give me references on recent advanced work on afterimages?*

Frank J. Pirone, M.D., Brentwood, L. I., N. Y.

ANSWER.—The afterimage of a normal person adapted to absolute darkness stimulated by a flash of white light consists of gradually increasing duration of colors in sequence: light blue, clear golden yellow, yellow green, spectral green, purplish crimson, and deep bluish green. Afterimages from colored light flashes are surprisingly similar. Weve tested the afterimages of well-educated and trained observers who were color blind. His results showed that such a person will not spontaneously describe a hue to which he is insensitive. The color blind person will use terms like "red" and "green," and will apply them correctly to known objects like leaves and flowers. However, on questioning, he will also say that the red blossom and the adjacent leaf are the same in color.

Weve found that the dichromat had afterimages following a white or colored stimulus, but they were either not colored at all or but faintly yellowish or bluish. No alteration of sequence was observed. The afterimages of the protanope were described as white followed by bluish color with a yellow halo. A red stimulus was followed by a short indefinable afterimage. After orange, the afterimage was dull blue. After green, it was faint yellow, then white. After yellow, it was bluish. The anomalous trichromat responded to a white stimulus with a yellow-green followed by a red and finally a dark blue afterimage. It is generally agreed that afterimage phenomena are photochemical because of the time intervals. Subjective colors may persist for several minutes and changes in retinal sensitivity to dim colors may persist even longer. No references are available on studies of afterimages in persons having brain injury. It has been demonstrated that afterimages are retinal and not cortical.

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PEMPHIGUS

TO THE EDITOR:—*A 46-year-old white woman has had chronic pemphigus for a number of years. She has had x-ray therapy over a period of years. She states that the radiologist told her that she had had all of the x-ray therapy that she could have. She now has an acute exacerbation of her pemphigus. Is corticotropin (ACTH) or cortisone indicated in this type of disease? If so, what is the dosage schedule?*

F. M. Karrer, M.D., McCook, Neb.

ANSWER.—This case should be restudied, for it is unusual for pemphigus to persist for a "number of years" nor does it respond to ordinary x-ray therapy. Bullous diseases, such as recurrent erythema multiforme, dermatitis herpetiformis, and dermatitis medicamentosa, should be considered in the diagnosis. The treatment currently recommended for true pemphigus consists of a combination of steroid drugs, antibiotic agents, and supportive therapy including, if necessary, frequent small blood transfusions. Steroid therapy should be instituted, beginning with doses large enough to control the symptoms quickly, up to 200 or 300 mg. of cortisone daily for a few days or 60 to 80 mg. of corticotropin; then the dosage should be reduced to a maintenance level.

SPINAL ANESTHESIA

TO THE EDITOR:—*In giving spinal anesthesia, is there any danger that the powder on surgical gloves could cause any complications in the spinal canal, such as adhesive arachnoiditis?*

M.D., Arizona.

ANSWER.—It would be highly unlikely that powder on surgical gloves could be introduced into the spinal fluid. It might be possible to do it, but the chance of introducing enough powder to do harm would be extremely remote. However, if powder were introduced in quantity, it might produce adhesive arachnoiditis.

CHRONIC GINGIVITIS

TO THE EDITOR:—*The reply to the query on chronic gingivitis that was in* THE JOURNAL, *March 27, 1954, page 1146, is inadequate. Of course, the question was not too explicit since there are many forms of gingivitis. Also in listing what was done for this patient, the dosages of vitamins and other materials and the exact therapy that already was given were not indicated. In addition no statement was made regarding the occlusion and other factors that are necessary to establish an accurate diagnosis and plan of treatment. Much could be done in a case such as this if a complete study were made by a competent periodontist, one of whom most likely can be found in the area in which this physician and his patient reside. Additional dietary studies and other necessary laboratory tests could be decided on by consultation between the periodontist and the physician. Nothing in the information supplied would, as far as I can see, indicate the need for a search for galvanosis and certainly the application of silver nitrate is contraindicated.*

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Chairman, Periodontia Department
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209 E. 23rd St., New York 10.

ENTEROBIASIS DURING PREGNANCY

TO THE EDITOR:—*In* THE JOURNAL, *Jan. 9, 1954, page 186, I read the query about enterobiasis during pregnancy. Diethylenediamine (piperazine) hydrate is an effective drug against the Enterobius vermicularis (Oxyuris). It is relatively nontoxic, and the normal course of pregnancy is not affected in any way. I have used the following formula with satisfactory results: piperazine hydrate, 6 gm.; cane sugar, 3 gm.; sodium benzoate, 1 gm.; strawberry extract, 0.1 cc.; and water, c.s.p. 100 cc. with a dosage of four spoonfuls daily (3.6 gm.), one at every meal, during 10 days (total dosage 36 gm.). Anal pruritus disappears almost immediately, and anal scrapings with the Cellophane swab (Hall's method) give negative results in over 90% of cases. It is not necessary to administer purges before nor after treatment.*

Jose G. Basnuevo, M.D.
Professor of Parasitology
University Hospital
Havana, Cuba.

CANCER IN RETAINED CERVICES

TO THE EDITOR:—*The letter from Dr. Alexander Brunschwig on cancer in retained cervices in the April 17, 1954, issue of* THE JOURNAL, *page 1400, is very impressive. However, it is our practice to retain the cervix in the absence of cervical carcinoma, because we are convinced there is better support to the vaginal vault and there is no shortening with resulting dyspareunia. It is our practice also to remove all mucosa readily removed by conization from below, and, after amputation of the uterus, it is again done from above, leaving only a small cylinder of muscle tissue. To destroy all mucosa is important. Examination some months postoperatively reveals a closed plug of muscle tissue only. Carcinoma cannot grow in the absence of epithelial cells. In any case of doubt, even in papillary cyst adenoma, we include removal of the cervix.*

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